

# COMMERCIAL CAR JOURNAL

with which is combined Operation & Maintenance

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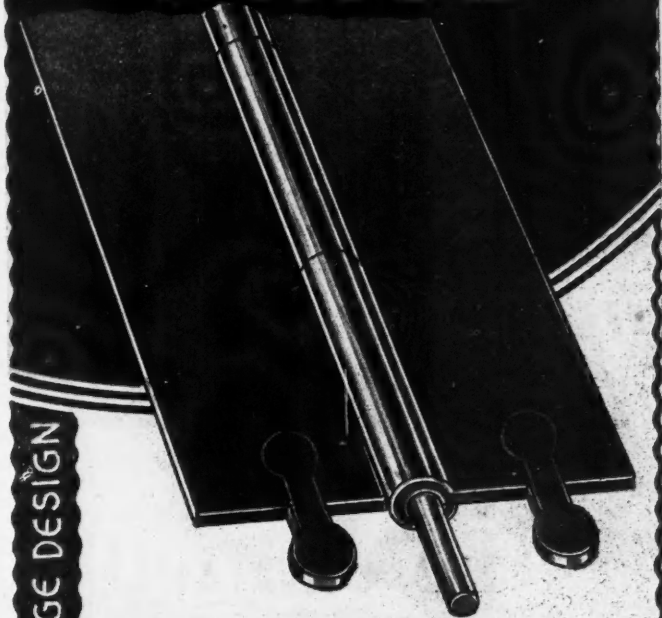
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COMMERCIAL CAR JOURNAL  
SEPTEMBER, 1936

# HANSEN Continuous HINGE



A NEW HINGE THAT MEETS NEW-DAY NEEDS IN HINGE DESIGN



Above—Section of Hansen Continuous Hinge, showing design and construction details.

At left—Two views of Hinge, before and after assembly.

### Hinges of All Lengths from One Length

ADVANCED and different in design, the Hansen CONTINUOUS Hinge is the logical successor to the piano type hinge. ONE standard length now supplies hinges of ALL lengths. Each length is of uniform design, 12" long. Simply by connecting multiples of this length, hinges of any length may be made.

### Only One Item to Stock for All Hinge Lengths

No delays waiting for odd or special lengths. With one or more boxes of this Hinge, packed 12 to a box, and all usable, there is but one length to stock for hinges of all lengths. Result—more usable hinges instantly available.

### Easy to Assemble

Hinge forms a strong, solid unit merely by connecting rod and couplings, as shown. For fractional lengths, cut off the last unit to desired length. No waste. Left-overs or odd lengths may be used on other jobs.

### Ask for Folder

A. L. HANSEN  
MFG. CO  
5047 Ravenswood Ave.  
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# TEXACO -

when he says

*"it stays full longer"*

he can tell you *why*

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low through, because Texaco Lubricants give a longer service, more bus-miles are lubricated with Texaco Products than any other brand.

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## *New* TEXACO MOTOR OIL

COMMERCIAL CAR JOURNAL  
SEPTEMBER, 1936





# The Overload



There's a chuckle in this. The picture was sent us as an example of a "well-balanced truck." It lost its balance when the driver stepped out of the cab. Imagine his surprise when the truck reared, moved slowly forward about 15 ft. and gently settled on its haunches with the front wheels resting on the top of a passenger car. After the passenger car was driven away, the driver brought his truck to earth again by getting back into the cab.

## Three L-o-n-g Years . . .

"THREE long years" may be a Republican campaign slogan to you but we shall always associate it with semi-trailer and third-axle specifications. So that you may get the allusion and not suspect us of being a victim of a heat wave, let us point out immediately that on pages 22-25 of this issue we make history by publishing, for the first time, complete Third Axle and Semi-Trailer specifications tables. They are the fruits of three long years of intermittent effort. You can imagine the joy we take in feeding the fruits to you.

## . . . End in Success But . . .

OUR effort began when personal contacts with and letters from fleet readers revealed that third-axle and semi-trailer specifications were wanted. That was practically a command because we always try not only to give the readers what they want but to anticipate their wants. (adv.) Immediately we made personal visits to trailer and third axle factories and tried hard to sell the idea. It went over with some and fell flat with others; but not too flat to discourage us. So we collected data, made

further visits, solicited suggestions and refused to be flattened. In June of this year we made the last batch of personal visits and met with such receptions that success was no longer in doubt.

## . . . Not Without Aches!

IT was only then that the really hard work began. We had to compile tentative tables and that meant conferences with trailer men, third axle men, engineers and fleet operators. The tentative tables (column headings, that is) were set in type and, by actual count, corrected and revised nine times in the case of semi-trailers and six in the case of third axles. They were revised again after the conferences and submitted for criticism to all trailer and third axle makers! Came the criticisms and came final revisions. After that came the headaches, the heartaches and the nervous anxiety that are scantily related on page 22. We know our enterprise will be appreciated by the entire industry. Our reward is the knowledge that we have made two very practical and original contributions for the benefit of our readers.

## C(ost) G(atherer) Anthony

THE Anthony cost series is now well on its way. The second article is on page 14. No end of credit must be given to Mr. Anthony for the exhaustiveness and comparative value of his figures. One of his virtues is "thoroughness." The third article is slated for October.

## More Cost Figures

THE many readers who have been begging for operating cost figures have an understanding friend not only in Mr. Anthony but also in Captain Axelson, of the Columbia Gas &

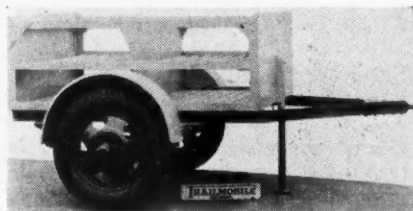
Electric fleet. Seeing our recent plea in this department for cost figures the Captain mustered a battalion of figures and forward marched them to your editor. This is the sort of cannon fodder we can appreciate and it's shot at you from pages 28 and 29.

## Diesel Fuel "Spex"

THE diesel fuel specifications article on page 30 was originally scheduled for August publication but we held it up to make way for the first Anthony article. It will bring you up to date on diesel fuels.

## Swiss Movement

TOTING a diesel'd demonstrator, Messrs. Jmfeld and Wakefield of S.A. Adolphe Saurer were due to arrive in the U.S. Sept. 4 to show the local boys how a Swiss movement can be incorporated into a truck. Way back in 1909 Saurer trucks were manufactured in the United States at Plainfield, N. J. In 1911, the record shows, a Saurer truck made the first transcontinental heavy-duty run (San Francisco to New York via Denver). On this visit the Saurer officials are interested in learning about American diesel practice—and



When hot weather puts on the pressure, this Trailmobile trailer is used to haul 54 additional cases of Coca-Cola hitched to the regular route truck. The unit is of all-steel welded construction and sold through Watson Automotive Equipment, Baltimore. There may be an idea in this for some operators who need to handle extra loads at times



When seven good fellows get together, they will find room enough for themselves in this seven-man cab. The job is a 3-ton FWD, equipped with the special cab, a platform type body with lockers underneath, double-drum winch, boring machine and T-type pole derrick operated by the Toledo Edison Co.



## The Overload

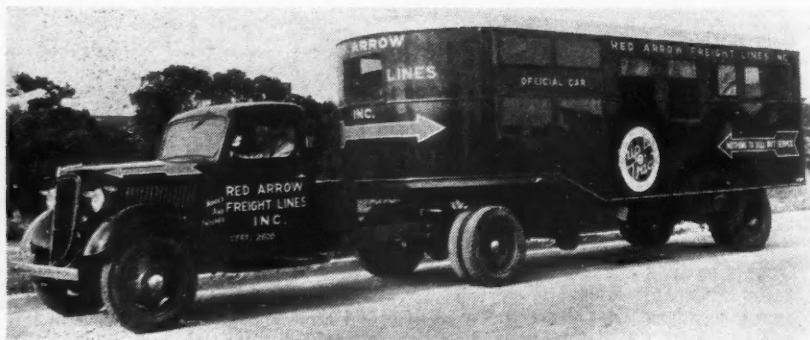
incidentally—in sounding out American manufacturers on the possibility of building the Saurer diesel under license. Their pet is a small high-speed job (6 cyl., 80 by 120 mm., 3.62 litres displacement). Besides flowing from the home plant at Arbon, Switzerland, it is manufactured under license in France, Italy, Austria, Poland, England and (soon) in Germany.

### Life of an Insert

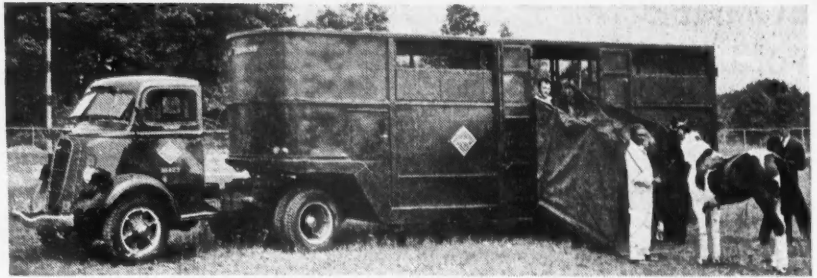
**T**HE life of a hard-faced exhaust valve-seat insert seems to be difficult to determine. The longest life reported to date is 350,000 miles. This was reported by a bus fleet. The difficulty in determining actual life arises from the earlier failure of other parts of the block, making it necessary to scrap the block before the full life of the hard-surfaced seat can be gauged. Isn't there a truck fleet somewhere that can take the honors away from this bus fleet?

### Employment Bureau

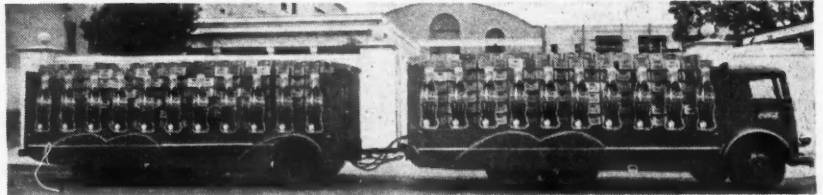
**N**OT all of our readers seem to understand that when we mention the availability of certain men for jobs or the availability of certain jobs, we make no charge for the service. The only requisite is that the man is now or will soon be in need of a job, or that the job now needs or will soon need a man. The reason for that stipulation ought to be clear to all employers and employees. Which brings us around to mentioning the availability of a man who has made a highly satisfactory record in reducing the operating cost, and bettering the safety record of a newspaper fleet. He would like to connect with another newspaper in most any part of the country, and will furnish details of his record.



The office of the Red Arrow Freight Lines need never be closed now that this traveling office has been put to use. The trailer houses a combination of business office, kitchen, beds, shower bath and lavatory. Also a telephone which is connected at stops. Red Arrow may now claim an office in every town. Tractor is a Ford



The Railway Express leads by a nose with this efficient trailer unit. The van was specially built to handle the transportation of horses and is so constructed that it may be used for freight hauling work in seasons when horses do not choose to run. Tractor is a Studebaker 2 to 3-ton cab-forward model



There's just a mere 24,480 bottles, or 1020 cases, of Coca-Cola loaded on this Mack traffic type truck and trailer! If you want to know how much of a load that is, pause to drink a bottle a day and it will take 67 years to consume the drink that refreshes. There are 400 cases on the truck and 600 on the trailer. Both bodies are all-metal with aluminum alloy floors. Clever use is made of the stake body for displaying metal bottle cut-outs

### Home-swheel-home

**I**SN'T there some place in this tourist-trailer fad that light truck chassis could find a place? Appreciating the desire of most persons to have the separate use of the motive power when they are not out touring, there must be a class of persons that could afford a "trucktourhome" and find it a great deal more convenient and practical. The truck has certain definite advantages: easier handling, greater safety, more space through the use of camel-back design, and heating and cooling arrangements to defy the weather and the seasons. Who'll be the pioneer?

### 100,000 Grindless Miles

**V**ALVE grind periods with hard-surfaced inserts are, of course, more readily determined. Reports of 50,000 and 75,000-mile periods are quite com-

mon. But what is the record? An Ohio shop reports the case of a truck that traveled 100,000 miles without a valve grinding job. Has any truck fleet beaten this? Let's have the figures for our record book.

### International Economy

**S**PLITTING the scenery that lays close along the Canadian road from Windsor, Ontario to Moncton, New Brunswick, a Chevrolet Maple Leaf truck (Canadian cousin of the American Chevrolet), aided and abetted by a Truxmoe third axle, carried 14,000 lb. of concrete, a driver and a Canadian Automobile Association observer 1246 miles with some impressive results. The CAA, which did the weighing, inspecting and compiling, sponsors the following figures: Gross weight, 20,000 lb.; gasoline average, 12 m.p.g., or \$27.48 for the trip; oil consumption, 1 pt. at 20 cents; water consumption, 1½ pt. for the trip; total operating cost, \$27.60, or 2 1-5 cents per mile.

### School for Spraying

**F**LEETS that are planning to set up refinishing departments should be interested in knowing that a free training course in the technique of spray-painting and the use and care of spray-painting equipment is available at The DeVilbiss Co. Laboratories, Toledo, Ohio. The next training periods, lasting one week, begin Oct. 5, Nov. 2 and Nov. 30. The company has made arrangements for special rates at hotels. Write the company for information.



# To the GROUND



The other fellow's light are Hormel's gravy. This company has its name outlined in reflector buttons on the front and rear of each of its six refrigerator trailers and thus capitalizes on the advertising value of its equipment by night. The handsome body of the trailer with Dry-Zero insulation was built to haul 12 tons of beef by the Grady Body Co., Austin, Minn. Panels are of aluminum. The tractor is a White and trailer is a Trailmobile

## Aluminum Announcement

This department has a spy who knows aluminum when he sees it and he has reported that great quantities of it are going to be used in some new trailer models which will be offered as standard models before long. From careful calculations it is possible to tell that aluminum will be used for everything but the running gear.

## Streamline Stuff

New methods in construction and new devices to make them possible are being used here and there in body building. With a little more experience there will be announcement to the effect that you can now individually tailor streamline bodies to any measurements without undue expense or dies.

## Better Buses

The tests on a large order of diesel-electric buses showed such swell acceleration and fuel economy that this department's

Detroit operative is now openly cheering. He has been suspected of being a diesel enthusiast for some time.

## Engine Enjoiner

Before we desert this diesel theme let us make you aware of another of our discoveries. There will be another light diesel engine (less than 300 cu. in.) This department is informed that it has impeccable manners so far as smell and noise are concerned. Six is the number of cylinders.

## Injector Interest

There is no end to our diesel information this month. For instance, one of our very good snoopers plied his trade to good advantage. He was rewarded by finding out that a company that has so far shown no interest in the diesel engine is the owner of patents on an injection system and will go to work on them whenever they decide that it is the wise thing to do.

## Filter Fillip

According to advance reports, one passenger car manufacturer will break the ice on the oil filter situation. This car will be equipped with a good filter and the instruction book will say that it is necessary to change the oil for the seasons only. It will be necessary to change the filter cartridge when you find the dipstick dirty.

## DeLuxe Delivery

A quality passenger car builder will desert the exclusive policy thus far rigidly adhered to and, according to our "man upon the ground," will offer a high-class line of commercial cars at an upper bracket price about the first of next year. This department assures you that the operative who reported this is trustworthy and dependable.

## Hypoid Handiwork

A general quiz of the entire staff of this department discloses that most of next year's crop of passenger cars will have hypoid rear axles. From this we may be sure that floor heights will be lower and that tunnels should to a large extent be eliminated.

## Front-End Filibuster

Our spies even catch the newcomers whose habits they do not know. They found, in possession of a complete newcomer to the industry, all of the telltale evidence of development of a front-drive unit for house-to-house delivery. Said newcomer was so abashed at our enterprise that he promised us permission to put all interested parties in touch with him.

## Prophets—Phooey

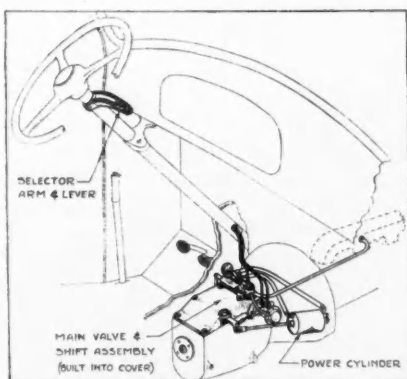
Do not permit yourself to get excited over the rumors you must be hearing of weird changes in the engine of a popular truck. Our collective ears are so close to the ground on this one that we are in danger of sustaining bruises and contusions. There will be some changes, probably best defined as refinements, but nothing of a radical nature.

## Shock Absorber Salaam

Working as smoothly as a well-oiled machine the field force lays on our desk notice that a shock absorber is being developed for trucks and trailers. The outlined benefits are longer truck life, lower maintenance and protection of cargo. COMMERCIAL CAR JOURNAL hopes to corral enough facts to have something to say on this subject before long.

## Faster Filter

This department will have to give orders for its Michigan operative to keep in close touch with Mr. Plank of Grand Rapids. Scarcely had the ink become dry on this department's rather feeble description of Mr. Plank's defroster and ventilator when advice was received that Mr. Plank was about to produce a new oil filter which he asserts will handle oil faster than we are used to thinking about. The new filters will be built in one size and will use a cotton filter element for heavy work, and then a lamb's wool element for the serious business of intercepting even the most minute particles of foreign matter. Lamb's wool, so Mr. Plank tells us, will not settle down, a very annoying thing to have happen to a filter element, consequently it does its work with neatness and dispatch.



This line drawing of the Evans Products Co.'s Auto-Shift shows how the unit is operated by a vacuum suspended cylinder. Shifting is done by means of a selector lever on an arm attached to the steering post, under the wheel. All control mechanism is built as a unit in the transmission cover. The shift is made either by setting the selector lever to the gear desired and then depressing the clutch or by first depressing the clutch and then setting the selector lever





# A BLIZZARD of

## WINTER MAINTENANCE SURVEY

Based on Replies from 151 Fleet Operators Showed That:

### IN COOLING SYSTEMS

- 82 used volatile anti-freeze.
- 27 used non-volatile.
- 38 used both.
- 4 used none.

- 17,955.5 gal. of alcohol were used.
- 3,350 gal. of Prestone were used.
- 1,618 gal. of other types of anti-freeze were used.

—16.82231° was the average temperature to which operators protected their trucks.

93 operators stored their trucks in heated garages; 40 in unheated; 13 in heated and unheated, and 5 were non-committal.

### ON WINDSHIELDS

- 107 operators used windshield defrosters.
- 42 operators did not.
- 2 operators were non-committal.
- 66 operators used electric windshield defrosters.
- 44 operators used fans.
- 3 operators used impregnated defrosters.
- 20 operators used heater tubes.
- 17 operators used defrosters of other types, and other methods, such as frost shields, vacuum tubes, double glass, chemicals, etc.

(As can be seen from these totals, a number of the operators replying used two or more types of defrosters.)

### IN CABS

- 104 operators used cab heaters.
- 45 operators did not use cab heaters.
- 2 operators were non-committal.
- 20 operators used exhaust heaters.
- 91 operators used hot water heaters.
- 1 operator used a steam heater.
- 1 operator used a kerosene heater.
- (Again, several operators used two or more different types of cab heaters.)

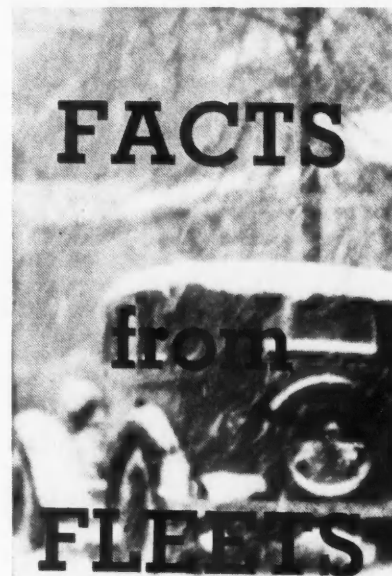
(TURN TO PAGE 91, PLEASE)

**W**HISTLING winds and freezing temperatures . . . Ice and cold and sleet and snow . . . Slippery roads and clouded vision . . . Discomfort and hardship for fleet drivers . . . Schedule-defying conditions which try to the utmost the efficiency of truck and driver and operator are just ahead, although a little hard to visualize just at present. With this thought in mind, COMMERCIAL CAR JOURNAL circularized fleet operators with a questionnaire designed to reduce the serious problem of winter maintenance to its most common terms, so that fleetmen may know how other fleet operators are dealing with the problems arising in winter operation.

These winter maintenance questionnaires went out to fleet operators in the snow belt, where freezing temperatures, snow, and ice are common problems. One hundred and fifty-one replies were received, with fleetmen over a wide area responding generously with full and detailed explanations of their methods of dealing with winter maintenance. The average fleet replying consisted of 26.31 vehicles (22.41 trucks and 3.9 passenger cars).

### Cooling Systems

The average temperature, to which the vehicles covered by this survey were protected with anti-freeze, was 16.82 deg. below zero. This does not necessarily mean that the average temperature of the region included was that low, but it is the average temperature to which competent protection had to extend. To meet the challenge of below-zero cold, 82 of the operators replying to the question of the kind of anti-freeze used, used a volatile anti-freeze, 27 used a non-volatile anti-freeze, 38 used both volatile and non-volatile anti-freezes, and 4 used no anti-freeze at all. A total of 19,573.5 gal. of volatile materials were used, and 3,350 gal. of the non-volatile. And the fact that 40 of the fleet operators "stabled" their vehicles in unheated garages added to



on

the necessity for complete anti-freeze protection. Thirteen operators used both heated and unheated garages, and 93 operators stored only in heated garages. The remaining five operators were non-committal on this subject.

A number of apparent reasons for the selection of the anti-freezes described above immediately suggest themselves, such as the permanence of the non-volatile fluids, the cheapness of the volatile fluids, the severity of the winter to be guarded against, but it is interesting to go more deeply into operators' preferences as indicated by their answers to the question: "What are the reasons for your choice of anti-freeze?" Space prevents going into all the reasons advanced, but here are some of the arguments pro and con, volatile vs. non-volatile.

The "volatiles" speak first. "Price and, in case of accident to radiator, loss





# Winter

## MAINTENANCE

**Revealed by 151 Fleets Operating 3631 Vehicles in Commercial Car Journal's Winter Maintenance Survey. Here Are the Measures Fleets Take to Soften the Winter "Blow"**

**A Report of the Commercial Car Journal's  
Readers' Service Bureau, Edward H. Miller, Manager**



is not as great." "For trucks I prefer alcohol—cheap and effective." "Economical." "We are distributors of this product." "Low cost. Anti-freeze high because of faulty radiator and pump." "Alcohol is a clean solution. It was used in cars kept in warm garages at night." "Old-fashioned idea. Never used anything else." "Not as expensive as other kind and cannot keep pump

packing from leaking." "Gives least trouble at less cost." "Trouble free if you buy quality." "In our line of work radiators are often damaged. Hence alcohol to prevent waste." "Cost of alcohol in comparison with others. Like (non-volatile) for cars." "Least expensive in sections where cold snaps are not too frequent or extended." "Positive action—no corrosion." "We were

running some old equipment and had bad radiators." "Due to bad road conditions the radiators spring too many leaks." "Cheaper, most practical in a water system which is not perfect." "I buy the best grade of alcohol and find it the cheapest for trucks."

The "non-volatiles" reply. "Best all round type available." "Because it does  
(TURN TO PAGE 91, PLEASE)



**T**HE preceding article in this series compared a few of the expenses entering into the operation of gasoline and diesel motored trucks, over California highways by the Pacific Freight Lines, Los Angeles, Cal. Many requests have been received for data covering full costs of operation of both types of equipment including trailers.

This article deals with every expense item entering into the operation of motor equipment, including overhead, traffic solicitation, damage claims, terminal outlay and other expenses not as a rule included in truck costs.

To secure a representative average of full cost of operation, a study was just completed of the operations of 25 transportation companies, operating in California and Arizona. The equipment in these 25 fleets ranged from a minimum of three trucks and trailers to a maximum of 63 trucks and trailers. The study embraces 241 trucks and trailers, 85,613 truck days and 16,003,640 truck miles. The trucks were all of the six-wheel variety, with an average tare weight of 17,900 lb. and allowable gross weight of 34,000 lb. They had a purchase price range of \$7,000 to \$9,000 each. Eighty trucks were powered with



**By C. G. ANTHONY**  
Vice-president, Pacific  
Freight Lines, Los Angeles,  
Cal.

# Opening the Books On *A Diesel and Gasoline* **TRUCK and TRAILER** Operating Cost Study

**A Comparative Cost Study That Includes Every Expense Item Entering Into Truck-Trailer Operation and Embraces 80 Diesel and 161 Gasoline Powered 6-Wheel Trucks and 6-Wheel Trailers, 85,613 Truck Days and 16,003,640 Truck Miles**





**TABLE 1**  
**Cost of Operation Truck and Trailer Unit**

A	ITEM	Truck 6-Wheel Gasoline	Truck 6-Wheel Diesel	Trailer 6-Wheel 10-Ton
1	Cost delivered with body	\$ 7300	\$ 8500	\$ 3000
2	Replacement cost of tires	720	720	614
3	Turn-in value, 5% of cost	365	425	150
4	Amount to be depreciated	6215	7355	2236
5	Cost per gallon of fuel	.1375	.0386	
6	Cost per gallon of oil	.4802	.4802	
7	Cost per tire and tube	72	72	51
8	Number and size of tires	10-40x8	10-40x8	12-38x7
9	Miles per gallon of fuel	3.25	6.01	
10	Miles per gallon of oil	180	150	
11	Weight empty (pounds)	17375	16100	10840
12	Net payload (pounds)	10625	15900	23100
13	Allowable gross weight (pounds)	34000	34000	34000
14	Estimated economic life (miles)	400000	450000	500000
<b>B FIXED COST (Dollars per Year)</b>				
15	Fixed overhead (See Table 2)	\$1722.50	\$1722.50	
16	Federal Old-Age Benefit	42.00	42.00	
17	Federal Unemployment Compensation	85.70	85.70	
18	Insurance compensation	11.00	11.00	
19	Insurance Theft (1/2 investment)	9.12	10.82	3.75
20	Insurance P. D.—\$50,000	142.18	142.18	108.82
21	Insurance P. L.—(100 M to 300 M)	287.70	287.70	215.76
22	Insurance Fire (1/2 investment)	62.06	72.25	25.90
23	California Weight Fee and License	73.00	73.00	73.00
24	Arizona Weight Fee and License	189.50	189.50	189.50
25	Drivers' wages (75 cents per hour)	2250.00	2250.00	
26	Total fixed charges per day	\$4875.73	\$4887.43	\$574.93
27	Add trailer costs	574.93	574.93	
28	Total truck and trailer combined	\$5450.66	\$5462.36	
29	Total cost per day (250 days)	21.80	21.84	
<b>C VARIABLE COST (Dollars per Mile)</b>				
30	Fuel (Item 5 divided by Item 9)	\$ .04234	\$ .00659	
31	Oil (Item 6 divided by Item 10)	.00300	.00320	
32	Tires and Tubes	.01336	.01336	\$ .00821
33	Maintenance (See Table 3)	.03362	.03310	.00815
34	Depreciation (Item 4 divided by Item 14)	.01653	.01634	.00447
35	Total variable cost per mile	\$ .10785	\$ .07286	\$ .02183
36	Add trailer cost	.02183	.02183	
37	Total truck and trailer unit	\$ .12968	\$ .09461	

Cummins six-cylinder diesel motors and 161 trucks powered with gasoline motors of various makes, Waukesha predominating. Each truck averaged approximately 187 miles per day for 250 productive days per year, with a 51 per cent load factor. The trailers were all six-wheel equipment, with an average tare weight of 10,840 lb., hauling an allowable gross weight of 34,000 lb., the combined gross weight of the truck and trailer unit being 68,000 lb., with a payload of approximately 20 tons.

**T**HE operation is one of truck load lots only, the greater portion of the hauling consisting of liquid petroleum products, in bulk. The greater portion of the miles operated was over paved highways of Southern California and between Los Angeles Basin points, and Phoenix, Arizona, and vicinity.

The average cost of operating a diesel truck, gasoline truck and trailer, as developed from the study, is shown in Table 1. Table 1 is divided into three parts. Under Part A is recorded certain basic units of interest; Part B deals with fixed costs per year and per day and Part C embraces variable costs per mile. The fixed costs are those costs incurred independent of the miles traveled. The variable costs are those costs incurred only when the trucks are moving. The fixed costs vary inversely with the miles traveled; the variable costs vary directly with the miles traveled.

**A**LL of the fixed cost items are self-explanatory, with the exception of Item B-14, fixed overhead. A detail of fixed overhead is shown in Table 2. There was a great variation in this expense item, it being the only one where there was not a fair degree of uniformity. Because of the lack of uniformity in fixed overhead, the high and low for each subdivision is shown in addition to the average. Totals are not shown for the high and low columns as such (TURN TO PAGE 44, PLEASE)



Some of the Cummins diesel powered truck-trailer tank units, used for hauling petroleum products throughout California and Arizona, on which the cost study is based



# We BUY Beauty At \$30 Per TRUCK

... And Find It a Paying Investment In Customer Goodwill. Giving Out Beauty Treatment Ourselves Saves Us \$2900 Yearly

**W**ASHINGTON housewives know us by the trucks we keep.

With a reputation in Washington, D. C., of fine work, the Manhattan Laundry & Dry Cleaning Corp., is particularly careful that the appearance of its truck equipment should not make that reputation look silly. Consequently, we point towards keeping our 36 trucks "dressed to kill."

Good appearance in trucks is not a mere incidental to truck operation. This equipment is the artery of the laundry business. The equipment reaches out to all parts of the city and is instrumental in our contact with thousands of customers. If we collect soiled laundry in dirty, banged-up equipment and then attempt to deliver laundered goods in this same equipment, it would be a double insult to our customers. Certainly they would be justified in thinking that our truck equipment reflects the condition of our laundry plant. And what woman wouldn't hesitate to entrust her laundry to us then?

**A**S few of our customers ever see our plant, the idea of efficiency, cleanliness and service must be carried to them. So delivery of merchandise and delivery of this idea of cleanliness, efficiency and service are the two major functions of our fleet. It is this second-function in which I am interested.

We keep our trucks painted and neat for the very low sum of \$30 per job. This includes a strip-down job. When finishing over the old paint, this cost totals not more than \$26. The complete refinishing job is done once every two



By **JOHN W. LOWE, Jr.**, Vice-president, Manhattan Laundry and Dry Cleaning Corp., Washington, D. C.



**JOHN LOWE** tells how the Manhattan Laundry, Washington, D. C., performs its truck beauty treatments and saves money over former costs. This company saves \$100 per vehicle on painting, \$25 per truck on lettering and \$1400 a year on fender straightening by doing the work in its own shop with the aid of fender straightening equipment.



\$30 per truck every two years keeps these units "dressed to kill." Opposite page—Fender straightening equipment saves the company \$1,400 yearly

years. Every 12 months, however, all equipment is touched-up and waxed; wheels, and sometimes fenders are brushed. This touch-up job costs us approximately \$4. Periodic washings cost us approximately 35 cents per truck. These costs are based on labor and materials only.

Thus the total cost to the company for keeping the appearance of its equipment well preserved and neat is approximately \$700 a year. In return for this modest investment in truck beauty the company enjoys the confidence of its hundreds of customers.

Our beauty practices are simple but efficient. As our trucks are on the road every day under all weather conditions, they must stand a lot of wear and tear. The body finish is alternately baked by the sun and subjected to penetrating dampness or humid weather. Two years on the streets and they are ready for a complete beauty treatment.

**W**HEN the old finish is not stripped off, we simply sand down the surface, filling the cracks and leveling in the conventional manner, of course. We are particularly careful to remove all traces of wax. Failure to remove the wax from every inch of the surface and from corners would result in a ruined job. Over the sanded surface two coats of surfacer-primer are applied, one immediately after the other, and allowed to dry over night. Primer-surfaces coats are sanded the following day and then two finish coats of special Manhattan blue synthetic enamel are applied in succession. These coats are allowed to dry overnight. The following day the decals are applied. All fenders of Manhattan's trucks are finished in black; wheels in red.

Application of primer-surfacers and

finish coats is with the spray gun. Primers are thinned about 10 per cent with turps. The first color coat is thinned about 10 per cent and the second is applied full strength with the spray gun held 8 to 10 in. from the body. All fenders and wheels are brushed.

A further saving is effected in the use of decals. We used to pay \$30 per truck for a lettering job. By using decals and simplifying the lettering, we have cut this cost for lettering to \$5.10 per set of decals per truck.

**F**ORMERLY, our paint cost per truck was \$125. Here is an actual breakdown of our present costs per truck:

#### Refinishing Costs

		Labor and Cost	Materials and Costs	
Sand and spray two coats of primer-surfacer	9 hrs.	\$2.07	½ gal.	\$1.62
Wet sand and spray color	7 hrs.	1.61	1 gal. (Sandpaper)	4.00
Brush enamel fenders...	2 hrs.	2.00	Qt. black	1.25
Brush wheels—two coats	3 hrs.	.89	Pt. red	.62
Clean and paint chassis...	5 hrs.	1.15		
Decals and stripe.....	5 hrs.	5.00	Decals	5.10
	31 hrs.	\$12.52		\$13.04
		Refinish: Total.....		\$25.57
Strip paint job.....		Labor and materials.		5.00
		Strip and Refinish: Total.....		\$30.57

**A**LTHOUGH actual labor on a refinishing job is 31 hours, such a job, with one man working usually ties up a truck for approximately 5 days. It may also be noted that a helper does the sanding and paint spray work while a skilled finisher does the brush and decal work. By teaching a helper to handle the spray gun and with occasional supervision we are able to have the spray painting done in a highly satisfactory manner at the lowest possible cost. Regardless of shop opinion (TURN TO PAGE 52, PLEASE)



# CLOSING THE GAPS ON

# Spark Plug SELECTION and SERVICE

**S**PARK PLUG cost can be reduced materially by intelligent selection and careful maintenance of spark plugs. Just how much of a reduction can be effected depends entirely upon the characteristics of the engines they are used in and the type of service to which they are subjected. But to get spark plug economy it is necessary to know plugs.

To begin at the beginning there are only three sizes of plugs used in modern trucks. The three sizes are 14 mm., 18 mm., and  $\frac{7}{8}$  in. The Ford Model T uses one-half inch pipe size. The mm. is an abbreviation for millimetre which is a unit of linear measurement in the metric system. It is about .039 in. The size of the spark plug is determined by the diameter of the shank or threaded portion. Thus an 18 mm. plug is no more or less a metric spark plug than a 14 mm. plug and the word "metric" used in connection with a spark plug is not descriptive of its size. The  $\frac{7}{8}$  in. plug is measured only by inches. This explanation is given because there are frequent references made to " $\frac{7}{8}$  metric" plugs and "metric plugs" meaning 18 mm. plugs.

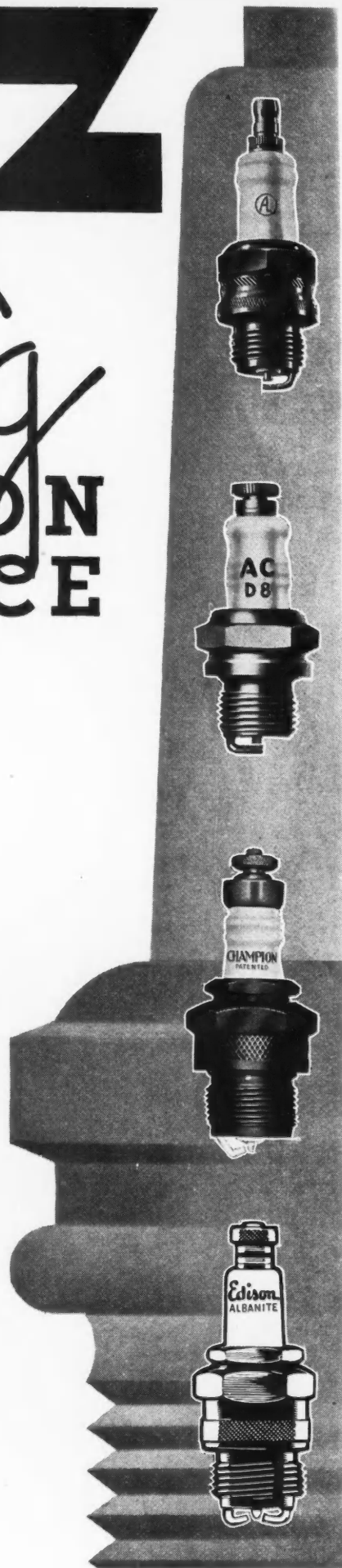
The size of a spark plug has nothing to do with its characteristics so far as the service man is concerned. The size is selected by the truck manufacturer and nothing is done about it except in rare cases. Selection of the proper plug in the heat range is the problem in which the fleet operator can interest himself to advantage.

**T**HE spark plugs which come with a new truck are selected because they are the plugs which will operate most efficiently in the service which the truck manufacturer anticipates a new truck will be put. In selecting these plugs it must be taken into account that a new vehicle does not as a rule start in immediately upon severe service. Later the truck may work in a type of service which will require spark plugs of a different type. Truck manufacturers have several different recommendations depending upon the service to guide the fleet operator but the weakness in these recommendations is that the truck manufacturer cannot make a special study of each individual operation and consequently cannot know just how severe the service is.

Spark plug manufacturers supply charts which show the heat range by different types of spark plugs and it is possible from these charts to determine which plug is the next hottest and which is the next coolest to the type which is operating unsatisfactorily in an engine. This again is excellent guidance but it cannot be taken as a substitute for careful study on the part of the fleet operator.

**S**ELECTING the proper type spark plug would be a simple matter if the

Illustrations on this page (reading top down) are of Auto-Lite, AC, Champion and Edison spark plugs





By **HENRY JENNINGS**, Technical Editor, Commercial Car Journal

**How Would You Test a Spark Plug for Compression Leakage? How Much Can a Spark Plug Leak Without Affecting Its Efficiency? Is the Plug to Blame for "Pinging"? Well?**

service were all severe or all light but when these two types of operation are combined in the daily work of a truck the problem becomes complicated. For instance, a meat packer's truck leaves the garage in Philadelphia and starts for Hammonton, New Jersey, a distance of 35 miles. This distance is covered as fast as it is legally possible to operate and upon arrival in Hammonton the truck is engaged in delivering meat to stores. The work in Hammonton is of a very slow nature and there is much idling to be done. Upon completion of deliveries in Hammonton the truck starts back on a fast trip to Philadelphia. These are actual details of an operation that has given a great deal of spark plug trouble. Of course the type and condition of the engine enter the problem but the engine involved in this instance is an engine that is used in large numbers in trucks and it is ordinarily in good condition.

The spark plug manufacturers make spark plugs that will give the greatest range possible in one plug but there are limits to what can be accomplished with one plug. The cool type of spark plug is one that carries the heat away from the spark plug electrodes at a rapid rate while the hot plug is one that dissipates the heat more slowly. The rate with which the heat is carried away is governed by the length of the path the heat must travel to reach the shell and cylinder head. Naturally a cool plug must be used where the engine is used for high speed or full load and the hot plug should be

(TURN TO PAGE 51, PLEASE)

Illustrations of spark plug failures on this page (reading from top down): The first plug is too hot; the porcelain is badly blistered. The second plug is also too hot. Center electrode is burned away. The third plug is okay for heat. It is simply worn out. The bottom plug is too hot; porcelain is broken



**A**FTER about six years of experience, our company is so thoroughly "sold" on the practical value of semi-trailers that we now use them almost exclusively in approximately 500,000 miles of trucking operations each month, which consists mostly of scheduled runs of 80 to 300 miles out of Chicago. The only exceptions are the use of straight trucks for local pick-up of loads under 2000 lb. and in a few deliveries where a truck-trailer combination would be less efficient. For example, into narrow alleys or cramped loading places, or where there are low overhead canopies.

However, our present almost exclusive use of semi-trailers came about gradually, and brought certain trailer management problems which we must watch carefully, since some of these problems are still in the experimental stage with our company.

**A**BOUT six years ago the company purchased its first semi-trailer. The next year another trailer was added; seven more the third year; 12 the next year; 38 in 1935; and 30 more were added during the first half of 1936.

The first trailers purchased by the company were small—16 and 18 ft. in length, with comparatively light tires and axles and brakes, and coupled with light-duty tractors. Plenty of difficulties resulted. It was hard to keep our boys from over-loading these comparatively light trailer bodies. Such over-loading caused an abnormal number of tire blow-outs. Axles would not hold up properly. The light brakes would not hold the excessive loads; and regardless of considerable attention given to

# MANAGEMENT METHODS in *Trailer* OPERATION

**Details of a Mid-West Freight Carrier's Program That Hinges on Periodic Service and is Proved Profitable by 35 Million Miles of Trailer Operating Experience**



**By L. N. HARTER**  
Superintendent of Operations,  
Decatur Cartage Co., Chicago

the safety training of drivers, our total accident experience was bad. We had road break-downs and service interruptions with

good-will losses.

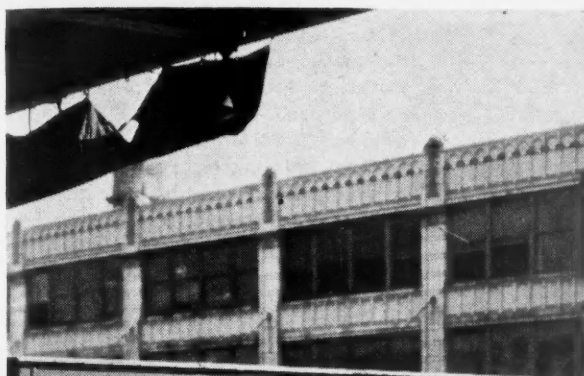
There were immediate service and upkeep improvements when we began, about two years ago, to get longer and heavier trailers—this time 20 and 22 feet; and most of our present total of 80 trailers are 20 and 22 ft. in length. On our new trailers the axle size was increased from six inches to eight. Now we almost never have axle troubles.

**T**HE story is about the same for our trailer brakes. It demanded some boldness, in the middle of the "depression" years, to specify 3-in. brake bands for trailer units, instead of the former 2-in. ones. A little later we specified 4-in.

COMMERCIAL CAR JOURNAL  
SEPTEMBER, 1936







Semi-trailers shown here are typical of the modern units operated by Decatur Cartage as a result of its study in trailer operation.

bands. But our records soon proved the economy, when coupled with more attention to brake inspections and adjustments, of larger brake bands in spite of their greater cost. We have found that the new 4-in. brake linings actually last three to four times as long as the 2-in. linings. Under our new plan of more careful inspecting and adjustment, we often get 50,000 to 60,000 miles before relining is necessary. Our new plan requires the daily inspection of brakes by an expert in our central garage, and all brakes are thoroughly checked once a month.

Results have been equally interesting and important for our trailer tires. As previously mentioned, we used to have a good many blowouts, and our average mileage was low. But in 1935 we began increasing the size of our trailer tires from 32 x 6 to 8.25 x 20. The results were immediately so encourag-

ing that we soon went to still heavier trailer tires. Practically all of the tires now are 9.00 x 20 and some are 9.75 x 20 on the heavy refrigeration trailers. The trailer tire problem is becoming a matter of records with us.

We are serious enough about it to have begun keeping records for each individual trailer and truck tire, including all spares in use. We are convinced in general about economy results from our new inspection and upkeep methods for trailer tires. But our new plan of individual tire records gives us accurate data which we know stimulates our inspectors and drivers; and these mileage records help us in getting adjustments on the few tires that prove to be faulty in materials or workmanship.

**O**UR new tire program fixes responsibility on each driver for the maintenance of the tires of his own truck and

trailer. For example, some of our drivers have been getting only 40,000 miles and others 100,000 or more from their tires. Our average tire mileage has been around 60,000 miles. But our experience to date indicates that our new plan should enable us to get an average of 75,000 to 80,000 miles from our trailer and truck tires.

We have found the problem of trailer tires to be tied in closely with the problem of trailer axle and wheel alignment. Our experience demonstrates that our trailers must be watched closely to insure the best wheel alignment. Even on a new trailer, the wheels may be forced slightly out of alignment through incidents that could not be charged to anyone in particular—maybe from the stress of normal road operations, or maybe from a sidewise jolt to the trailer in backing up with a heavy load.

**T**HESE management problems have emphasized to us the importance of thorough methods for the continuous inspection of our trailers. Formerly, we relied on each driver to make his own inspections, and we carefully trained our drivers to this end, as a part of our program for greater operating efficiency.

(TURN TO PAGE 62, PLEASE)



# Announcing

## SEMI-TRAILER and 3<sup>rd</sup> AXLE Specifications

**I**T is with a great deal of pleasure and pardonable pride that Commercial Car Journal publishes on the following pages detailed specifications of Third Axles and of Semi-Trailers.

This is a history-making event, because never before have such specifications been available to the industry at large.

In presenting the specifications at this time we entertain several hopes. We hope that readers will make good and frequent use of the data; that manufacturers will reap tangible benefits for their splendid cooperation, and that both tables will enjoy the prestige among fleets, Federal agencies, state, county, township and municipal governments that for years has been enjoyed by Commercial Car Journal's truck Specifications.

There is every reason why this prestige should be accorded the new tables. The material is being compiled by the same agency and in the same way. The same efforts are exerted in the collection of authentic data and to insure accurate publication.

**ALL** material is collected direct from the manufacturers themselves. They guarantee the authenticity of the data submitted.

While the Semi-Trailer and Third Axle Specifications in this issue are authentic, the editors of Commercial Car Journal would be the last to say that the Tables cannot be improved. Experience has taught us otherwise. Never has this publication sponsored a specifications table that did not undergo periodical changes calculated to improve its value. Therefore readers are urged to study the tables critically and submit their suggestions for making the tables meet all their requirements. For one thing, there is room for the addition of a few more columns.

**T**HE column headings as they stand were not chosen haphazardly. They are the product of study and discussion extending over the last three years (actually!). Familiarity with the needs of our readers made us aware that the tables were wanted. Our first

job then was to sell manufacturers on the idea of publishing detailed specifications, and to get them to promise co-operation. The second task was to frame tentative specifications tables. This entailed a thorough study of trailer and third-axle literature, and personal discussions with manufacturers, with engineers and with fleet operators. Once framed, the tentative tables were submitted to all those groups for criticism. And there was no lack of criticism.

The tables were revamped finally and forms submitted to manufacturers with instructions to guide them in filling in data for publication in September. Then came the inevitable delays, the misunderstandings, the exchange of countless telegrams and air-mail letters clarifying various points, seeking additional data, demanding corroboration of submitted data, and all urging speed. Eventually the specifications were in

type and proof-read with uncommon care. Proof-sheets were struck and air-mailed to manufacturers for okays or corrections. The "deadline" was so uncomfortably near that in the case of semi-trailer makers, corrections were requested by telegraph. The pleasure we take in presenting these tables springs from the knowledge that it is a good job well done, thanks to all hands concerned.

**T**HERE is only one matter pertaining to both tables that remains undetermined. That is the frequency of publication. At the moment we are not prepared to say whether third-axle and semi-trailer specifications will be published every other month, quarterly or semi-annually. It is our conviction that the determining factor should be the frequency with which manufacturers in these two groups make specifications changes. We will procure that answer by submitting monthly correction forms to all manufacturers. If the corrections are few and minor we will publish only the corrections in the first available issue as a matter of record. If they are numerous we will announce our policy with regard to publication of the complete tables. You'll have the answer before the snow flies.

With a final grateful acknowledgment to the manufacturers, we refer readers to the tables and we hope they prove of inestimable value to the entire industry.—G. T. H.

## Explanatory Notes

### Third Axles

**General—(a)** The capacity of the third axle (Column 2) is not to be confused with the total capacity made possible on the converted vehicle.

**Column 1** is for listing the trade name and model designation of the third axle and in parentheses the truck makes and models that it will fit.

**Column 3.** The price of the unit includes the standard brakes specified in brake column and frame extensions that extend forward under the cab. Tires and brake (air or vacuum) power are not included in price.

**Column 4.** The weight of the third axle unit includes all appurtenances and maximum tires.

**Columns 6 & 7** are for listing the upper and lower ends of the weight distribution range possible with the third axle. If there is no range, the weight distribution is in the first column.

**Column 12** gives make and type of brakes that are standard. As a general rule, a variety of options is available with corresponding changes in price.

**Column 15** gives the total brake lining area of the attachment unit only.

### Semi-Trailers

**General (a)**—Only standard production semi-trailer models are included in the listing.

**Column 2** gives the price of the chassis, f.o.b. factory. The price includes the following: standard length chassis; standard tires; power brakes; landing gear; tail and stop light; upper half of fifth wheel, and brake and electrical connections and fittings that are considered part of the trailer's equipment.

**Column 3** The maximum body and payload rating of the semi-trailer is based on the axle rating in Column 26.

**Column 4** The weight of the complete chassis includes the weight of items included in the price in Column 2.

**Column 8** gives the longest frame length available as a standard option at extra cost. Special lengths longer than the longest standard length are available also at extra cost.

**Column 9** Frame height is the distance from the ground to top of frame over the rear axle with standard size tires, loaded.

**Column 35** The price of the fifth wheel, lower half, is f.o.b. factory. It does not include mounting.



# COMMERCIAL CAR JOURNAL THIRD-AXLE SPECIFICATIONS

Explanatory Notes on Column Headings Appear on Page 22; All Material Copyright 1936 by Chilton Co. [Inc.]

THIRD AXLE MAKE AND MODEL  and Truck Model adapted to	Capacity (Lb.) See Explanatory Notes	Price (f. o. b. factory)	Weight (Lb.) with Max. Tires, Frame Extension, Etc.	Maximum Tire Size	LOAD DIS- TRIBUTION RANGE		Axle Spacing (with maximum tires)	AXLE DATA			BRAKES (Standard)					Number of Points of Frame Support	Spring Size or Number Leaves Added	Spindle Diameter (at inner bearing)
					(First figure of combination applies to center axle; second figure to third axle)	Make		Type	Size	Make and Type	Drum Material	Drum Diameter and Width	Lining Area					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Trailing Axles																		
ACME																		
50 (Ford 1½)	10000	300	1460	32x6-10	50-50		42	Own	T	3¾	BM	CA	16x2½	181	2	4 or 6	2½	
60-H (Chevrolet 1½)	10000	325	1560	32x6-10	50-50		42	Own	T	3¾	CH	PS	16x3	217	2	7 or 9	2½	
GUILDER																		
C (All Makes)	8000	499	1420	32x6-10	50-50	65-35*	46	Tim	T	3¾	LHV	CA	16x2½	135	6	39x2½	2½	
E (All Makes)	8000	544	1710	7.50/20	50-50	65-35*	46	Tim	T	3¾	LHV	CA	16x2½	135	6	39x2½	2½	
F (All Makes)	10000	645	1810	34x7	50-50	65-35*	46	Tim	T	4	LHV	CA	16x2½	135	6	39x2½	2½	
H (All Makes)	10000	695	2369	8.25/20	50-50	65-35*	48	Tim	T	4	LHV	CA	16x3½	206	6	40x3	2½	
J (All Makes)	12000	803	2464	9.00/20	50-50	65-35*	48	Tim	T	4½	LHV	CA	16x3½	206	6	40x3	2½	
K (All Makes)	12000	928	2660	9.75/20	50-50	65-35*	48	Tim	T	4½	LHV	CA	17¼x4	296	6	40x3	2½	
K-L (All Makes)	12000	1078	2850	9.75/20	55-45	65-35*	49	Tim	T	4½	LHV	CA	17¼x4	296	6	42x3½	2½	
L (All Makes)	14000	1177	3075	10.50/24	55-45	65-35*	52	Tim	T	5	LHV	CA	12¼x4	296	6	42x3½	2½	
M (All Makes)	16000	1294	3200	10.50/24	55-45	65-35*	52	Tim	T	5	LHV	CA	17¼x5	370	6	42x3½	3	
HI-LO																		
F-36 (Ford 1½)	10000	350	1625	32x6-10	60-40		44½	Lig	Sq	2½	BMV	CA	16x2½	167	2	6	2½	
C-36 (Chevrolet 1½)	10000	385	1700	32x6-10	60-40		44½	Lig	Sq	2½	LHV	CA	16x2½	160	2	9	2½	
LE MOON																		
TU (Ford 1½)	10000	350	900	32x6-10	50-50		40	Tim	T	3¾	BM	CA	16x2½	158	1	1 plate	2½	
LITTLE GIANT																		
6-ton (For any 1½ ton truck)	12000	308	1200	32x6	50-50	60-40	42	Own	Sr	2½	LHV†	CS	16x2½	336	6			
8-ton (For any 1½ ton truck)	16000	451	1575	32x6	50-50		42	Shu	Sq	2½	LHV†	CS	16x2½	336	4			
8-ton (For any 2 ton truck)	16000	575	2000	6.50/20	50-50		42	Shu	Sq	2½	LHV†	CS	16x3	420	4			
10-ton (For any 2½ to 5 ton truck)	20000	695	2410	9.75/20	50-50		44	Shu	Sq	4	LHV†	CS	17x3	460	4			
PERFECTION																		
HDF (Ford)	10000	380	1804	32x6-10	50-50		42	Own	Sr	2½	BM	CI	16x2½	167	2	42x3	2	
HDC (Chevrolet)	10000	440	1824	32x6-10	50-50		42	Own	Sr	2½	BMV	CI	16x2½	167	2	42x3	2	
TIMKEN																		
SBT-900-H (Federal 15, 18, 20; GMC T-16, T-18; Brookway 78, 87, 90X, 96; Indiana 86; Diamond T 212-A; Dodge LF-35; Studebaker Ace)	8000	***	1910	7.50/20	55-45		44	Tim	T	3¾	LHV	CA	16x2½	132	1	48x2½	2½	
ST-730-BY (Ford 1½)	8000	***	1674	32x6-10	55-45		44	Tim	T	3¾	BMV	CA	16x2½	158	1	48x2½	2½	
ST-740-H (Chevrolet 1½)	8000	***	1681	32x6-10	55-45		44	Tim	T	3¾	LHV	CA	16x3½	206	1	48x2½	2½	
TRUCKTOR																		
HLF (Ford 1½)	8800	432	1415	32x6-10	50-50	60-40	40	Own	Sr	3	BM	CA	16x2½	179	6	38½x2½	2½	
HLC (Chevrolet 1½)	8800	432	1356	32x6-10	50-50	60-40	41	Own	Sr	3	CH	CA	16x3	219	6	38½x2½	2½	
HLD (Dodge 1½)	8800	432	1217	32x6-10	50-50	60-40	41	Own	Sr	3	LH	CA	16x2½	132	6	38½x2½	2½	
HLL (Light trucks tires to 34x7 inclusive)	11000	557	1536	34x7	50-50	60-40	45	Own	Sr	3	LH	CA	16x2½	132	6	38½x2½	2½	
HLR (Medium truck tires to 9.75/20 inclusive)	16000	999	2374	9.75-20	50-50	60-40	48	Own	Sr	3½	LH	CA	16x3½	204	6	40x3	2½	
HR (Heavy trucks tires above sizes listed)	21000	1218	2828	10.50/24	50-50	60-40	52	Own	Sr	4	LH	CA	17¼x4	280	6	41½x3	3½	
TRUXMORE																		
17 (Ford)	8800	415	1691	32x6-10	55-45	65-35*	42	Own	Sq	2½	BMV	CA	16x2½	180	4	**	2½	
17 (Chevrolet)	8800	415	1691	32x6-10	55-45	65-35*	42	Own	Sq	2½	LHV	CA	16x2½	148	4	**	2½	
20 (All makes)	8800	450	1784	32x6-10	55-45	65-35*	42	Own	Sq	2½	LHV	CA	16x2½	148	4	**	2½	
25 (All makes)	11200	680	2208	34x7	52-48	65-35*	46	Own	Sq	2½	LHV	CA	16x3½	206	4	**	2½	
30 (All makes)	13000	925	2509	9.00/20	50-50	65-35*	46	Own	Sq	3	LHV	CA	17¼x4	252	4	**	2½	
40 (All makes)	20800	1065	3336	10.50/24	50-50	65-35*	51	Own	Sq	3½	LHV	CA	17¼x5	350	4	**	3½	
UTILITY																		
15 (For any 1½ ton truck)	7500	300	900	7.00/20	55-45	66-33	40	Own	Sq	2½	BMV	CA	15x2½	152	4	None	2½	
25 (For any 2 ton truck)	9000	389	1100	7.50/20	55-45	66-33	41	Own	Sq	2½	OM	CA	16x3	180	4	None	2½	
30 (For any 3½ ton truck)	13000	594	1600	9.00/20	55-45	66-33	44	Own	Sq	3	OM	CA	17x4	264	4	None	2½	
35 (For any 5 ton truck)	18000	700	1900	10.50/24	55-45	66-33	50	Own	Sq	3½	OM	CA	17x6	396	4	None	2½	
Driving Axles																		
GRICO																		
(Ford 1½)	10000	738	6200	34x7-10	50-50		42½	Ford	T	3½	BM	CA	14x4½	175	3	42½x2½	2½	
(Chevrolet 1½)	10000	702	6100	34x7-10	50-50		42½	Chev	T	3½	LH	CA	16x3	214	4	42½x2½	2½	
THORNTON TANDEM																		
AF (Ford 1½)	10000	735	6300	34x7-10	50-50		42	Ford	T	3½	BM	CA	14x4½	170	3	42x2½	2½	
AC (Chevrolet 1½)	10000	735	6250	34x7-10	50-50		42	Chev	T	3½	LH	CA	16x3½	210	3	42x2½	2½	

## ABBREVIATIONS:

### General

\*\*\*—Timken—Prices under revision

\*—Load distribution may be shifted readily even when truck is loaded, on the road.

\*\*—Truxmore—Heavy steel beams (cushioned by patented spring arrangement) used in place of leaf springs.

†—Little Giant - or BM

### COLUMN 9

(Axle Make)  
Chev—Chevrolet  
Ford—Ford

Lig—Liggett

Own—Own

Shu—Shuler

Tim—Timken

### COLUMN 10

(Type of Axle)

Sq—Square

Sr—Solid round

T—Tubular

### COLUMN 12

(Brakes, Make and Type)  
BM—Bendix mechanical

BMV—Bendix mechanical with vacuum power

brake

CH—Chevrolet hydraulic

LH—Lockheed hydraulic

LHV—Lockheed hydraulic with vacuum power

brake

OM—Own mechanical

### COLUMN 13

(Brake Drum Material)

CA—Cast Alloy Iron

CI—Cast iron

CS—Cast steel

PS—Pressed steel



# Commercial Car Journal SEMI-TRAILER Specifications Table

(See Explanatory Notes, p. 22  
Copyright 1936 Chilton Co. [Inc.])

SEMI-TRAILER MAKE AND MODEL	CHASSIS				TIRE SIZE		FRAME				SPRINGS				BRAKES				AXLE				FIFTH WHEEL (to match standard upper half)														
	Price (f. o. b. factory— see Note)	2	3	4	Maximum Payload Rating (based on Axle Rating)	Chassis Weight (includes weight of items included in Price.)	Standard		Maximum Recommended Size	Length		Height (in.)	Side-Rail Size and Type	Drop (in.)	Heat-Treated?	No.-and Type of Cross-Members	Size	Number Leaves	Shackle Type	Helper Springs	Radius Rods	Make, Type and Actuation	Drum Diameter and Width	Drum Material	Brake Lining Area	Automatic Emergency	Make	Maximum Rating (lb.)	Beam Section Dimension	Beam Type	Spindle Diameter (at Inner Bearing)	% Body & Payload on Axle	Landing Gear Type and Actuation	Distance: Kingpin to Front of Frame	Make and Type	Width	Price (lower half)
							Standard	Recommended		Longest Standard (at Extra Cost)	Standard (ft.)																										
1							7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35		
TWO-WHEEL																																					
AVAILABLE																																					
F-10	650	16000	26500	8.25/20D	34x7D	16	Opt	37	77x21x3x1/2 C	5	N 6C	42x3	8	8	S	Y	5	Y	LHV	16x21 1/2	CI	135	O	Tim	10000	4x1 1/2	Tu	28	2 1/2	HM	Opt	Own-D	30	75			
F-12	745	20000	31000	9.00/20D	36x8D	20	Opt	38 1/2	8x21 1/2 x 3 1/2 C	5	N 7C	42x3	10	8	S	Y	5	Y	LHV	16x21 1/2	CI	266	O	Tim	16000	5x1 1/2	Tu	28	3	HM	Opt	Own-D	30	75			
F-16	950	24000	36500	9.75/20D	8.75/20D	20	Opt	41 1/2	9 1/2 x 21 1/2 x 3 1/2 C	5	N 7C	42x3	10	8	S	Y	5	Y	LHV	17 1/4 x 4	CI	266	O	Tim	16000	5x1 1/2	Tu	28	3	HM	Opt	Own-D	30	75			
CORBITT																																					
T-10	575	16000	26500	6.50/20D	32x6D	16	20	38	9 1/2 x 21 1/2 x 3 1/2 C	5	N 5C	54x3	20	20	S	Y	6	N	LHV	16x3 1/2	CI	236	N	Tim	10000	4x1 1/2	Tu	28	2 1/2	None	20	Aus-D	24	78			
T-12	725	20000	31000	9.00/20D	9.00/20D	18	22	39	9 1/2 x 21 1/2 x 3 1/2 C	5	N 6C	54x3	20	20	S	Y	6	N	LHV	17 1/4 x 4	CI	264	N	Tim	14000	4 1/2 x 1 1/2	Tu	28	2 1/2	None	20	Aus-D	33	85			
T-14	895	24000	36500	9.25/20D	9.75/20D	20	24	40 1/2	9 1/2 x 21 1/2 x 3 1/2 C	5	N 6C	54x3	20	24	S	Y	6	N	LHV	17 1/4 x 4	CI	284	N	Tim	14000	4 1/2 x 1 1/2	Tu	28	2 1/2	None	20	Aus-D	33	85			
T-16	1050	28000	41450	9.00/20D	9.75/22D	22	24	41 1/2	9 1/2 x 21 1/2 x 3 1/2 C	5	N 6C	54x3	24	24	S	Y	6	N	LHV	17 1/4 x 4	CI	346	N	Tim	16000	5x1 1/2	Tu	3	60	None	20	Aus-D	33	85			
T-18	1360	36000	54000	10.50/20D	10.50/20D	24	27	40 1/2	9 1/2 x 21 1/2 x 3 1/2 C	5	N 7C	48x4	21	21	S	Y	6	N	LHV	17 1/4 x 5	CI	346	N	Tim	18000	5 1/2 x 1 1/2	Tu	3 1/2	60	None	20	Aus-D	33	85			
EDWARDS																																					
A-2	610	14000	20000	6.50/20D	32x6D	14	Opt	Opt	9 1/2 x 21 1/2 x 3 1/2 C	5	N 8B	40x2 1/2	11	11	B	Y	5	Y	BMV	16x21 1/2	CS	174	O	Cla	7500	3 1/2 x 3 1/2	Tu	21 1/2	55	M	Opt	Own	30	63			
A-3	735	19000	28000	7.50/20D	9.00/20D	16	Opt	Opt	9 1/2 x 21 1/2 x 3 1/2 C	5	N 8B	42x3	13	13	B	Y	5	Y	BMV	16x21 1/2	CS	174	O	Tim	10000	4x1 1/2	Tu	21 1/2	55	M	Opt	Own	30	63			
A-4	850	24000	36000	8.25/20D	9.75/20D	18	Opt	Opt	9 1/2 x 21 1/2 x 3 1/2 C	5	N 8B	42x3	15	15	B	Y	5	Y	BMV	17 1/4 x 4	CS	290	O	Tim	15000	5x1 1/2	Tu	21 1/2	55	M	Opt	Own	30	63			
A-5	1070	29000	43000	9.00/20D	9.75/22D	18	Opt	Opt	9 1/2 x 21 1/2 x 3 1/2 C	5	N 8B	42x3	15	15	B	Y	5	Y	BMV	17 1/4 x 4	CS	290	O	Tim	15000	5x1 1/2	Tu	21 1/2	55	M	Opt	Own	30	63			
FITZ GIBBON & CRISP																																					
UNIVERSAL-110																																					
212	638	18000	21650	7.00/20D	8.25/20D	16	24	37	8x21 1/2 x 3 1/2 C	5	N 5C	42x3	10	10	B	Y	7	N	BMV	16x21 1/2	CN	175	O	Tim	10000	4x1 1/2	Tu	28	2 1/2	HM	17	Aus-D	27	75			
216	812	21500	24900	7.50/20D	9.00/20D	18	26	39	9 1/2 x 21 1/2 x 3 1/2 C	5	N 6C	42x3	12	12	B	Y	7	N	TMV	17 1/4 x 4	CN	238	O	Tim	12000	5x1 1/2	Tu	28	2 1/2	HM	17	Aus-D	33	85			
316	1051	29000	34775	9.00/20D	9.75/24D	18	26	40	10 1/2 x 21 1/2 x 3 1/2 C	5	N 7C	48x3 1/2	14	14	B	Y	7	N	TMV	17 1/4 x 4	CN	288	O	Tim	16000	5x1 1/2	Tu	3	55	HM	17	Aus-D	33	85			
316	1200	33000	39005	9.75/20D	9.75/24D	18	26	42	10 1/2 x 21 1/2 x 3 1/2 C	14	N 5C	42x3	10	10	B	Y	7	N	TMV	17 1/4 x 4	CN	288	O	Tim	16000	5x1 1/2	Tu	3	55	HM	29 1/2	Aus-D	27	75			
110DF	718	18000	22050	7.00/20D	8.25/20D	16	24	33	10 1/2 x 21 1/2 x 3 1/2 C	18	N 5C	42x3	14	14	B	Y	7	N	BMV	16x21 1/2	CN	175	O	Tim	10000	4x1 1/2	Tu	28	2 1/2	HM	40 1/2	Aus-D	33	85			
316DF	1280	29000	39800	9.25/20D	9.75/24D	18	26	36	10 1/2 x 21 1/2 x 3 1/2 C	18	N 5C	42x3 1/2	14	14	B	Y	7	N	TMV	17 1/4 x 4	CN	288	O	Tim	16000	5x1 1/2	Tu	3	55	HM	40 1/2	Aus-D	33	85			
GENERAL MOTORS																																					
TT-218	505	14300	21650	30x5D	34x7D	16	20	35 1/2	8 1/2 x 21 1/2 x 3 1/2 C	6	N 6C	45x2 1/2	11	11	B	Y	11	O	BMV	17 1/4 x 3	NI	209	O	Tim	10000	4x1 1/2	Tu	28	2 1/2	HM	18	Own-D	27	60			
TT-218H	830	22300	27600	34x7D	9.75/24D	16	20	39 1/2	8 1/2 x 21 1/2 x 3 1/2 C	6	N 6C	45x2 1/2	11	11	B	Y	11	O	BMV	17 1/4 x 3	NI	279	O	Tim	15000	4 1/2 x 1 1/2	Tu	28	2 1/2	HM	18	Own-D	33	90			
TT-252	1010	28500	32500	34x7D	10.50/24D	18	22	42 1/2	11 1/2 x 21 1/2 x 3 1/2 C	6	N 6C	46x3	16	16	B	Y	7	O	TMV	17 1/4 x 5	NI	347	O	Tim	18000	5x1 1/2	Tu	28	2 1/2	HM	18	Own-D	33	90			
GRAMM																																					
DF-35	455	17000	21650	6.00/20D	8.00/20D	14	24	35 1/2	9 1/2 x 21 1/2 x 3 1/2 C	5	N 5C	45x3	12	12	B	Y	8	N	BMV	16x21 1/2	CN	178	O	Tim	10000	4x1 1/2	Tu	28	2 1/2	HM	15	Aus-D	27	65			
DF-36	555	17000	21900	6.00/20D	8.00/20D	14	22	36 1/2	10x21 1/2 x 3 1/2 C	5	N 5C	45x3	12	12	B	Y	8	N	BMV	16x21 1/2	CN	178	O	Tim	10000	4x1 1/2	Tu	28	2 1/2	HM	15	Aus-D	27	65			
DF-70	825	20000	28300	34x7D	9.75/20D	20	24	38 1/2	9 1/2 x 21 1/2 x 3 1/2 C	5	N 7C	45x3	13	13	B	Y	9	N	BMV	17 1/4 x 3	CN	228	O	Tim	12000	4 1/2 x 1 1/2	Tu	28	2 1/2	HM	15	Aus-D	33	75			
DF-71	910	20000	28300	34x7D	9.75/20D	20	22	38 1/2	10x21 1/2 x 3 1/2 C	5	N 7C	45x3	13	13	B	Y	9	N	BMV	17 1/4 x 3	CN	228	O	Tim	12000	4 1/2 x 1 1/2	Tu	28	2 1/2	HM	15	Aus-D	33	75			
DF-80	910	24000	30000	34x7D	10.50/20D	20	24	38 1/2	9 1/2 x 21 1/2 x 3 1/2 C	5	N 7C	45x3	15	15	B	Y	10	N	BMV	17 1/4 x 4	CN	304	O	Tim	14000	4 1/2 x 1 1/2	Tu	28	2 1/2	HM	15	Aus-D	33	75			
DF-81	995	24000	30400	34x7D	10.50/20D	20	24	38 1/2	10x21 1/2 x 3 1/2 C	6	N 7C	45x3	15	15	B	Y	10	N	BMV	17 1/4 x 4	CN	304	O	Tim	14000	4 1/2 x 1 1/2	Tu	28	2 1/2	HM	15	Aus-D	33	75			
DF-90	960	27000	32500	34x7D	11.25/20D	20	24	39 1/2	10x21 1/2 x 3 1/2 C	6	N 7C	45x3	17	17	B	Y	12	N	BMV	17 1/4 x 4	CN	304	O	Tim	16000	5x1 1/2	Tu	3	60	HM	15	Aus-D	33	75			
DF-91	1045	27000	30500	34x7D	11.25/20D	20	22	39 1/2	10x21 1/2 x 3 1/2 C	14	N 7C	45x3	17	17	B	Y	12	N	BMV	17 1/4 x 4	CN	304	O	Tim	16000	5x1 1/2	Tu	3	60	HM	15	Aus-D	33	75			
HIGHWAY																																					
77-A	510	16000	21000	6.00/20D	7.50/20D	16	24	40 1/2	9 1/2 x 21 1/2 x 3 1/2 C	5	N 4C3J	46x3	9	9	S	Y	5	Y	BMV	16x21 1/2																	







26



1

1. MONTPELIER MFG. CO., Montpelier, Ohio, built this CHEVROLET camel-back conversion, one of a number of interesting conversions which this firm has designed and built. The furniture van on the 157-in. wheelbase chassis is 15 ft. long, 84 in. wide and 84 in. high inside. Engine is shrouded. A double door is in the rear.

2. THORNTON TANDEM equipped this Ford with its third axle unit, extending the wheelbase to 163 in. The huge coke body is 7 ft. wide, 11 ft. long, and was built by the Thomas Wright Co., Jersey City. A high lift vertical hoist does the up-lifting.

3. THIS TRUXMORE third axle equipped GMT Model T-18 is operated by C. T. Villa, Buffalo. The body is a 16-ft. closed van. Cab is de luxe equipped, with V-type windshield. This unit is handsomely finished in two tones.

4. THIS handsome body was built by BODE-FINN, INC., on a DIAMOND T Model CD-217 with 151 $\frac{3}{4}$ -in. wheelbase. Special bakery body measures 106 in. long, 73 in. wide and 63 $\frac{1}{2}$  in. high inside. It is constructed of 20-gauge steel panels and has  $\frac{1}{2}$ -in. plywood lining. Weight of entire unit is 6175 lb.

5. THIS Model BM MACK truck, 163-in. wheelbase, is equipped with Model HLR TRUCKTOR third axle unit and a 16-ft. staked body. National Lead Co. uses it to haul paint—as heavy as lead! But it's a cinch for this unit.

6. FRUEHAUF built this interesting trailer which has frame and body built integrally. Tractor is a STUDEBAKER BOSS. Trailer is 25 ft. long, has a capacity of 1500 cu.ft., and total weight of body and chassis is 5700 lb.



10



11



2

3

# The ALBUM

Of Modern Truck Transportation Equipment



6

8



7

9

7. AUTOCAR UDFT is the key to this trailer train. The four-wheel trailer is an EDWARDS. Both bodies are of 6000-lb. capacity, 16 ft. long, 7 $\frac{1}{2}$  ft. wide and 6 $\frac{3}{4}$  ft. high, and were built by ORRVILLE BODY CO., Orrville, Ohio. They are insulated with 1 $\frac{1}{2}$  in. of DRY-ZERO in roof, sides and ends.

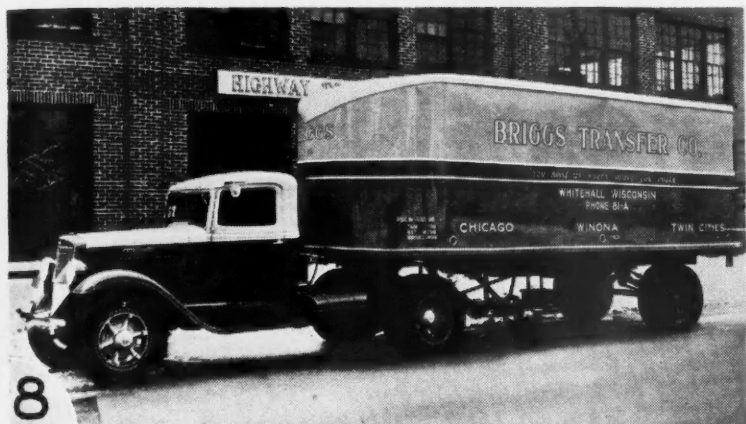
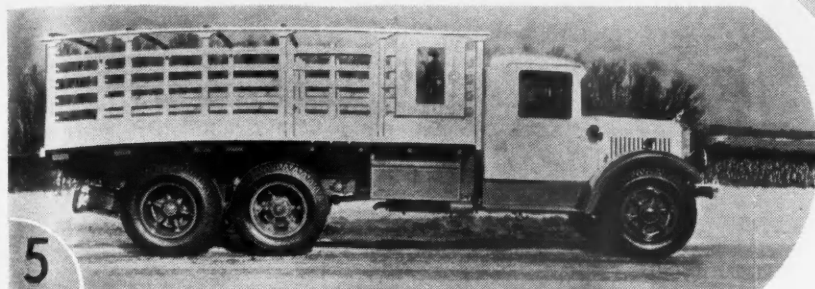
8.



12

13





8. THIS HIGHWAY custom-built refrigerated body is insulated with 1½ in. of DRY-ZERO. Equipped with theft-proof locks, body 22 ft. long, 8 ft. wide and 6 ft. high, and is mounted on a Highway 77-B trailer. An IHC tractor hauls the unit with its 8-ton load.



4

9. MACK, JR., Model 20 MD, 166-in. wheelbase, equipped with V-type, 88 to 110 case bottler's body. Constructed of welded steel frame and wood floor, body measures 12 ft. long, 6 ft. wide and 46 in. high. Hygrade operates this high-grade truck job.

10. THIS DODGE does a 200-mile trek every day hauling products of the Canvas Specialty Co., manufacturers of van pads in New York City. Loading is from both side and rear.

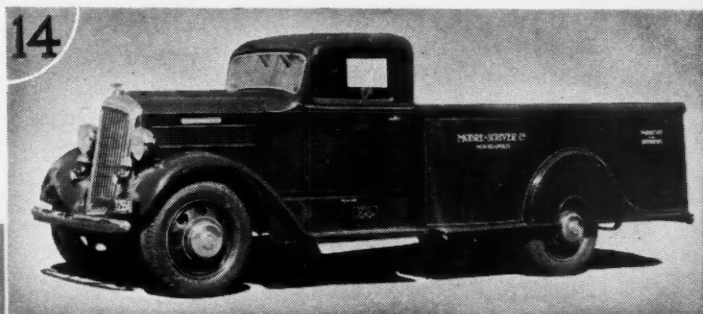
11. WHITE Model 718 was selected by the Standard Brewing Co. for beer hauling. Body is an open top on which is mounted a tarpaulin frame. Good use is made of the side body panels by Standard to advertise itself.

12. LE BLOND-SCHACHT offers this interesting camel-back job, put in operation by the Universal Carloading Co. Note that the cab, well over the front axle, gives the appearance of an all-payload-body job.

13. MARMON-HERRINGTON all-wheel-drive FORD V-8 has plenty of dynamite literally and figuratively. It is also equipped with a "spudder" for use in exploitation work in oil fields. Continental Oil Co. is the operator.

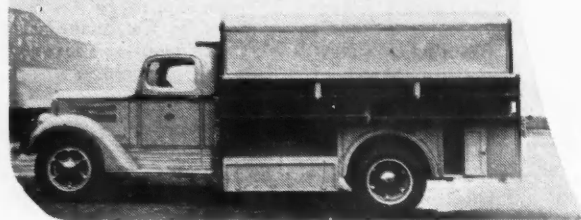
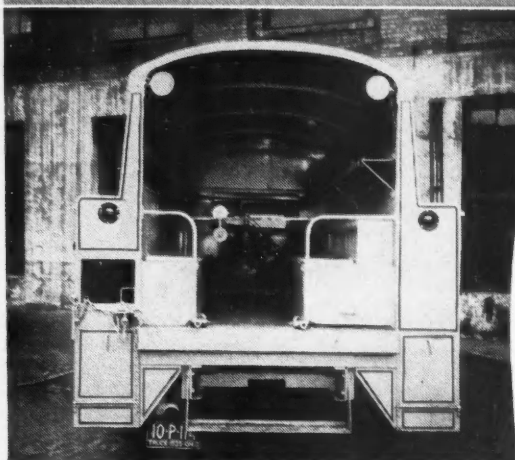
14. THIS REO 1½ to 2-ton furniture delivery truck is operated by Moore-Scriven Co., Minneapolis. Note the low, open top body and design of the skirt. Cab is de luxe equipped. A tarpaulin is used for protection from the weather.

15. THE Heinz Co. built this body in its own shop in Pittsburgh, using MET-L-WOOD panels, tailgate and doors, and mounted it on an AUTOCAR chassis. Side walls are ¾-in. Met-L-Wood. Note flush side doors, folding step in rear and tailgate-hinged door construction.





Below are views of a modern gas service truck equipped with compressor. Compartments are designed to hold just one day's supply of parts. On opposite page is a modern type of metal body mounted on a pick-up truck



## Five-Year Operating Cost Comparison (1931-35) For All Vehicles Operated

	1931	1932	1933	1934	1935
Average Total Investment.....	\$1,750,000	\$1,788,000	\$1,850,000	\$1,816,000	\$1,842,000
Average No. Company-Owned Vehicles.....	1,832	1,838	1,781	1,792	1,842
Average No. Rented Cars.....	173	155	140	155	175
Average No. All Vehicles.....	2,005	1,993	1,921	1,947	2,017
Total Miles Travelled.....	26,125,000	25,012,000	24,770,000	25,198,000	26,061,000
Total Operating Cost.....	1,719,000	1,462,000	1,314,000	1,295,000	1,286,000
Average Cost per Mile.....	.0658	.0585	.0530	.0514	.0493
Average Miles per Gallon Gas.....	10.80	11.77	12.01	12.03	12.39

## Summary of 1934 and 1935 Operating Costs (Itemized Portion Applies to Company-Owned Vehicles)

	1935	1934	% Change
Fuel (Gasoline).....	\$326,639	\$320,867	+ 1.8
Tires and Tubes.....	64,693	63,662	+ 1.6
Lubricants.....	29,882	31,126	- 4.0
Miscellaneous Direct Cost.....	81,387	86,578	- 6.0
Repairs—Labor.....	126,103	117,141	+ 7.7
Repairs—Material.....	138,708	137,513	+ .9
Repairs—Due to Accidents.....	5,574	6,001	- 7.1
Garage (Rent and Maintenance).....	60,886	64,397	- 5.5
All Other Garage Expenses.....	52,644	66,782	- 21.1
Superintendence.....	43,510	38,807	+ 12.1
License and Insurance.....	120,576	123,446	- 2.3
Depreciation.....	182,779	188,376	- 3.0
Total Expense—Company-Owned Vehicles.....	1,233,391	1,244,676	— .9
Total Expense—Rented Cars.....	52,294	50,369	+ 3.8
Total Expense—All Vehicles.....	1,285,685	1,295,045	— .7
Total Mileage—Company-Owned Vehicles.....	25,153,134	24,339,351	+ 3.3
Total Mileage—Rented Cars.....	907,450	858,960	+ 5.6
Total Mileage—All Vehicles.....	26,060,584	25,198,311	+ 3.4
Cost per Mile—Company-Owned Vehicles.....	.0490	.0511	- 4.1
Cost per Mile—Rented Cars.....	.0576	.0566	- 1.7
Cost per Mile—All Vehicles.....	.0493	.0514	- 4.1

AN article dealing with operating costs—like the operating costs themselves—is no better than the method that was used in arriving at the costs.

Consequently, there is pleasure in being able to recommend the accompanying cost figures to fleet readers as being the product of a management that spares no expense in compiling detailed operating statistics.

For the cost figures, we—and all readers—are indebted to The Columbia Gas & Electric Corporation.

While the operating costs of one fleet can never be directly comparable to the operating costs of another fleet, the figures given here come closer than most to providing a valuable comparison because the 1842 vehicles involved operate over terrain that ranges from level to hilly and mountainous, and from congested city conditions to open road conditions. Knowing your own conditions you can readily determine whether you should be proud of your own costs or not. Some of the figures may be useless for this purpose, but such statistics as miles per gallon of gasoline and per mile cost of oil for the same types of vehicles do give a comparable index

# The OPERATING Utility

Some of the lighter units operated by Columbia Gas are equipped with dump-type and panel bodies





Total Cost Per Mile, Maintenance Cost Per Mile and Miles Per Gallon of Company-Owned Vehicles for 1935, Broken Down by Types of Vehicles

Type of Vehicle	Number	Total Cost	Maintenance	Miles per Gallon
Pickups—1/4 and 1/2-ton	765	.0444	.0095	13.23
Light-Duty—1, 1 1/2, 2-ton	221	.0745	.0173	8.96
Heavy-Duty Trucks	127	.1405	.0307	5.83
Light Passenger Cars	593	.0393	.0071	15.25
All Passenger Cars	707	.0402	.0077	14.84

Cost Per Mile Itemization for Company-Owned Vehicles for 1935

Number of Vehicles	1842	Miscellaneous Direct Cost	.0032
Average Investment per Vehicle	\$892	Labor	.0050
Average Miles per Vehicle	13,655	Materials	.0055
Miles per Gallon	12.47	Garage (Rent and Maintenance)	.0024
Total Cost per Mile	.0480	All Other Garage Expenses	.0021
Gasoline Cost	.0130	Superintendence	.0017
Tires and Tubes	.0026	Licenses and Insurance	.0048
Lubricating Oil	.0012	Depreciation	.0073

Distribution of the Automotive Transportation Dollar on Company-Owned Vehicles for 1935

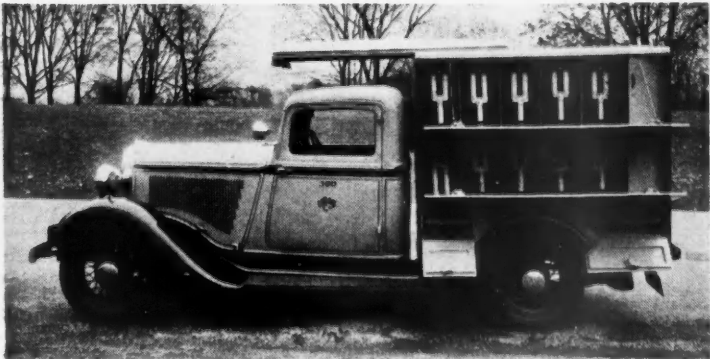
	%		%
Fuel (Gasoline)	25.5	Tires and Tubes	5.2
Repairs (Labor and Materials)	22.0	Garage (Rent and Maintenance)	4.9
Depreciation	14.8	All Other Garage Expenses	4.3
Licenses and Insurance	9.8	Superintendence	3.5
Miscellaneous Direct Cost	6.6	Lubricating Oil	2.4

Data Compiled and Furnished by  
**Captain O. A. AXELSON**, Automotive Engineer, Columbia Gas & Electric Corp., N.Y.C.



COSTS of a Fleet

This gas meter truck has a sliding roof. Note that it is pushed forward making it possible to stand upright



which should be fairly reliable.

In passing it might be said that the management ascribes not a little of its success in cost reduction during the last five years to control of the top speed of many of its vehicles, particularly through the use of throttle stops. Notably in two areas total cost per mile came down from .1003 in 1931 to .0630 and from .0678 to .0447.

Before referring you to the cost figures which tell their own story and need no explanations, we should like you to join us in a vote of thanks to Captain O. A. Axelson, the automotive engineer for this extensive fleet, who furnished the figures. They came to us as a result of an item in "The Overload" department of the June issue. "Here is a copy of our 1935 statistical report of automobile operations," wrote the Captain. "Perhaps you may find it of some interest."

We pass that same hope on to our readers, and hope also that among them will be some who can see the mutual benefits to be derived from releasing their operating cost figures in a form similar to that published here. Company names need not be revealed.





By JOSEPH GESCHELIN,

COMPANY	TRADE NAME	APPLICATION	HOW DISTRIBUTED	AREAS OF DISTRIBUTION
Standard Oil Co. of N. J., Pa. & La. Colonial Beacon Co.	Esodiesel three grades 206, 211, 230	High Speed Diesel	Tank wagon; barrels	New England, N. Y., Pa., S. C., N. C., Va., W. Va., Tenn., La., Ark.
Phillips Petroleum Co.	Fuel Oil No. 2, No. 3	Tractors; Road building		Peoria, Kansas City, Wichita, Minneapolis, Amarillo
Sinclair Refining Co.	Superflame Diesel 253, 355, 355 Winter	Auto and Rail Car	Tank car, tank wagon, drums	250 grade (East, South-east, South); 355 grade (Central and Western)
Gulf Oil Corporation	Straight Run Diesel	All		East of Mississippi River and Texas
Union Oil Co. of Calif.	Diesel	All	Bulk Station; Some Service Stations	Ariz., Colo., Idaho, Nev. Ore., Wash., (Alaska B. C., Hawaiian Isles, Bulk only)
Cities Service Co. Massachusetts	Fuel Oil No. 2 Fuel Oil No. 3	All	Truck or Tank Wagon; Drum or Tank	New Haven, Hartford, Boston, Lowell, Taunton, Portland, Presque Isle
Tulsa	Fuel Oil No. 3 Spec. Diesel 1 and 2		Bulk and Service Stn. Tank Cars	Ponca City, E. Chicago
Philadelphia	Fuel Oils 1, 2 and 3		Limited Distribution	Phila. district only
Atlantic Refining Co.	2 grades, not yet assigned	Hi-speed; Low speed	Tank Truck	Mesa, R. I., Conn. N. Y. State Barge Canal, Eastern half Penna., N. J., Delaware, Baltimore
Standard Oil Co. of Indiana	Standard	Hi-speed Engines	Tank Wagon and Barrels	Mich., Ind., Ill., Wis., Minn., Iowa, Miss., N. D., S. D., Kan., Mont., Wyo., Colo.
Sun Oil Co.	Furnace Oil Medium Diesel Fuel Light		Tank Wagon; Drum Tank Cars, Drums, Tank Wagon	Pa.; (Phila.); N. J. (Atlantic City); Newark, Trenton; Del. (Wilmington); Md. (Baltimore); R. I. (Providence); Conn. (Bridgeport); N. Y. (NYC, Newburgh, Peekskill, Syracuse, Rochester, Westchester Co.)
Continental Oil Co.	"Conoco" Diesel Dark Gas Oil Lewistown Dark	Hi-speed Low cetane Stationary Diesels	Tank Car only from Tank Car only Tank Car only	Ponca City and Artesia Ponca City only Lewistown, Mont. only
Richfield Oil Co.	Diesel Light	All Auto Diesel	From Bulk Plants	62 points in Wash. Oregon, Cal. Also some in N. Mex. Ariz., Utah, Nev., Idaho
Shell Petroleum Corp.	"Shell Dieseline"	All Auto Diesel	Drums, some Bulk Stations	Ala., Ark., Colo., Fla., Ga., Ill., Ind., Iowa, Kan., Ky., La., Minn., Miss., Mich., Mo., N. D., N. M., Neb., Okla., Ohio, S. D., Tex., Tenn., Wis., and parts of S. C., N. C., Va., W. Va.
Associated Oil Co.	"Associated Motor Diesel Fuel"	All Auto Diesel	Tank Car, Tank Truck	Calif., Ore., Wash. Hawaiian Isles; also parts of Idaho, Nev., Ariz.
Standard Oil Co. of California	Standard Diesel Oil 27 plus	General Automotive Use		Calif., Ore., Wash., Idaho, Nev., Ariz., Utah, Alaska, Hawaiian Isles
American Oil Co.	Amo Nos. 2 and 4		400 Branch Warehouses	From Maine to Florida, and inland

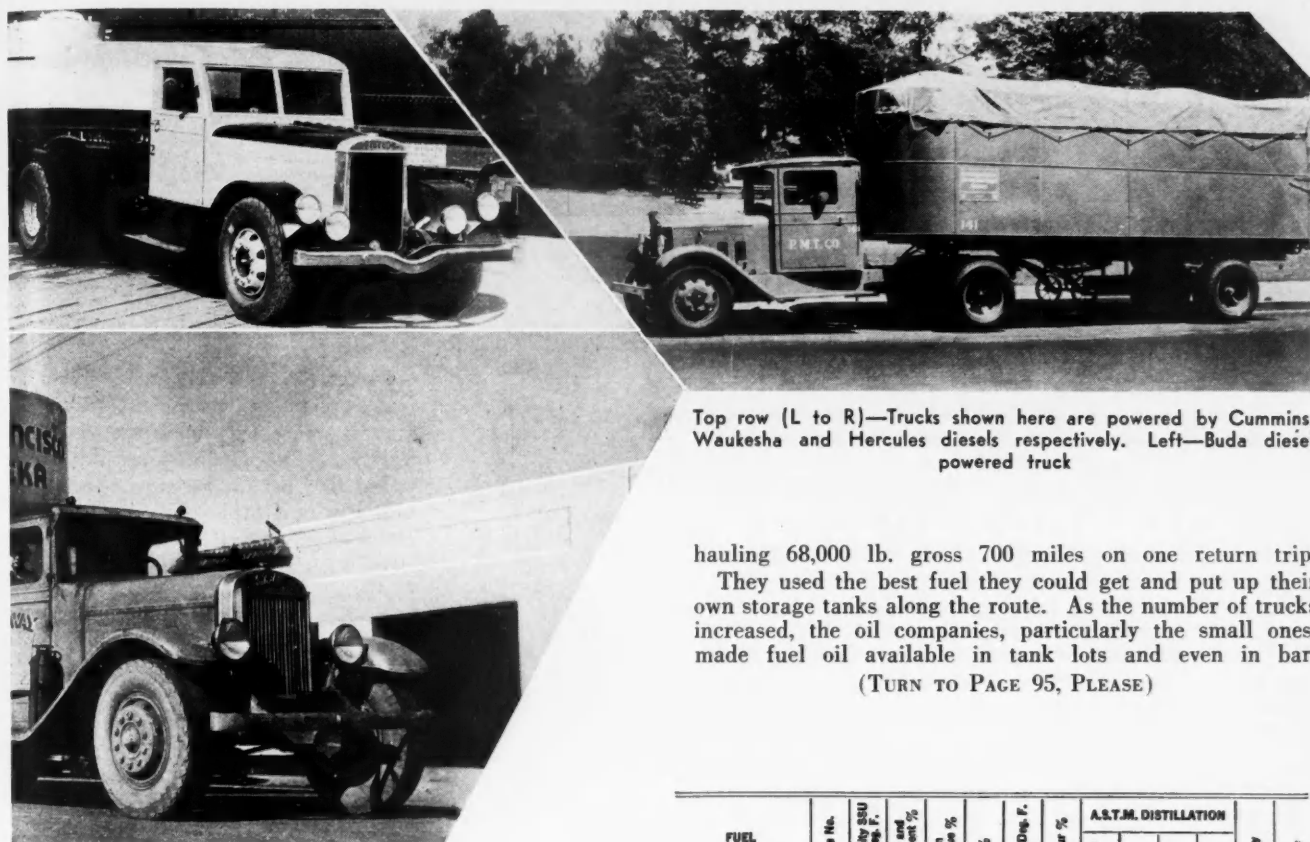
TABLE I  
Data on Specification Diesel Fuels

# UP-TO-DATE FACTS on Diesel FUELS

THIS article is based upon information contributed by a group of the largest oil refiners in the country. The editor urges all refiners not represented here to submit specifications on their diesel fuels for publication in a subsequent issue of Commercial Car Journal.

COMMERCIAL CAR JOURNAL  
SEPTEMBER, 1936





Top row (L to R)—Trucks shown here are powered by Cummins, Waukesha and Hercules diesels respectively. Left—Buda diesel powered truck

Detroit Technical Editor

If you are at all interested in the diesel engine—and what fleetman today is not—be sure to add another technical term to your growing vocabulary of special phrases. Add CETANE NUMBER, the index of ignition quality of diesel fuels.

Generally, if the cetane number is right for your engine (the engine builder can tell you what the number should be) the fuel will give good performance; if the number is wrong—well it's just like getting the wrong telephone number.

Which leads us to the point of the whole story, namely that in the opinion of everyone interested in the widest development of diesel power for truck transportation, it is important to get a quick jump on the diesel fuel situation. Enough work has been done on the high-speed diesel engine in the past few years to assure the fleetman that if he wants diesel power he has a pretty good choice of sizes and dependable makes of domestic powerplants. But the moment we think of widespread diesel operation we face the practical questions: what fuel, how do you specify it, where do you get it?

To give our readers the benefit of the latest flash on this subject, we have been in touch with 26 of the largest oil companies in this country. Some have nothing to offer in the way of diesel fuel, others do not have products suitable for automotive diesels for year-round operation. Those in position to supply special or regular fuel oils for automotive diesels are listed in tables 1 and 2.

JUST to go back a little. The hardy diesel pioneers started the early applications of truck diesels out on the West Coast where men are men and trucks think nothing of

hauling 68,000 lb. gross 700 miles on one return trip.

They used the best fuel they could get and put up their own storage tanks along the route. As the number of trucks increased, the oil companies, particularly the small ones, made fuel oil available in tank lots and even in bar-

(TURN TO PAGE 95, PLEASE)

FUEL	Cetane No.	Viscosity SSU 100 Deg. F.	Water and Sediment %	Carbon Residue %	Ash %	Flash Deg. F.	Sulfur %	A.S.T.M. DISTILLATION				Gravity	Pour Deg. F.	
								10%	50%	90%	End Point			
Standard Oil Co., Ind., "Standard"	50-55	40-45	.05 Max.	0.15 Max.	0.01 Max.	180 Min.	0.50		(480 560)	(600 700)				
Phillips Pet.Co.			.05 Max.			190			480 Max.	620 Max.			30-32	
No. 2.			.05 Max.											
No. 3.		70 Max.	0.1			200			480 Max.	620 Min.			26-32	
Sinclair "Superflame"														
250.	50	33	0	0.02	Trace	150	0.5	420	440	535	600	34-38	0	
355.	50	38	0	0.2	0	180	0.25	(380 410)	500	612	675	36-39	5	
(Winter) 355.	50	33	0	0.2	0	130	0.25	360	422	608	660	37-40	Zero	
Union Oil Co.														
"Diesel"	56	41		0.05		200	0.65						32.5	0
Cities Service Co.														
No. 2.			0.05 Max.	0.05		160	0.75		440 Max.	620 Max.	680 Max.		0	
Max.			0.1 Max.	0.15		200	0.75			620 Min.			10	
No. 3.		70												
Texas														
No. 3.	49	33		0.05	0	185	0.18	312	440	500	520	36.5	-10	
Spec. Diesel	No. 1.	55	33		Trace	0	0.070	303	410	561	592	36.5	Zero	
No. 2.	57	44		0.038	Trace	250	0.12	473	534	622	663	34.9	20	
Philadelphia														
No. 3.			0.1	0.18 Max.		150 Min.	0.75 Max.			(820 875)			26-34	10-0
Spec. Diesel	No. 1.		0.05	0.02 Max.		(110- 130)	0.5 Max.		410 Max.			600 Max.	35-40	0-15
No. 2.			0.05	0.06 Max.		(125- 140)	0.5 Max.		420 Max.			600 Max.	33-38	0-15
Son Oil Co.														
Furnace Med.	28-34	0.05	0.1	0		(125- 190)	0.15 Max.	(335- 380)	440 Max.	520 Max.	580 Max.	34-38	5 Max.	
Diesel Light	42	0.1 Max.	0.1 Max.	0.05 Max.		135 Min.	0.18 Max.	(375- 405)	(435- 465)	(525- 565)	(585- 725)	27-32	0	
Continental Oil Co. "Conquest" Diesel	58	40	Trace	0.02 Max.		200	0.2 Max.						0 Max.	0
Dark Gas Oil	44	35-38	0.05 Max.	0.15 Max.		190	0.5 Max.						0 Max.	0
Lowland Dark	61	45-55	Trace	0.14		240 Min.	1.0 Max.						18 Max.	
Richfield Oil Co. Diesel Light	35-40	Trace				150 Min.	0.75 Max.	(350- 400)			720 Max.	30 Min.	15 Max.	
Shell Petroleum Corp. "Shell Diesel"	38	0				150 Min.	0.75 Max.						30-37	10 Max.
Associated Oil Co. "Associated Motor Diesel Fuel"	35	Trace	0.05	0.1 Max.		150	1.0 Max.	430		500	740	30		
Standard Oil of California, Standard 27 plus	40	Trace	0.02	0		135	0.57		460	530			29.5	-10

TABLE II  
Diesel Fuel Specifications



## EDITORIAL COMMENTS

# After Hours

BY GEORGE T. HOOK EDITOR

## Safety Steps Out

THE first step in the direction of uniform safety provisions for trucks has been made. This was the publication by the Interstate Commerce Commission of proposed safety regulations applying only to motor vehicles in interstate or foreign commerce that are subject to the Federal Motor Carrier Act. The proposed regulations, in pamphlet form, have been circulated widely for the purpose of encouraging criticism. The next step will be a public hearing which will be held some time this month. The third step will be a revision of the regulations, if the criticisms justify such a course, and formal issuance by the Interstate Commerce Commission.

The fourth step toward uniformity for all motor trucks will be a public hearing to determine the extent to which the regulations should be made applicable to private trucks operating interstate. The fifth step will be the efforts made in individual states to revise safety regulations applying to intrastate operations to conform to results achieved in step number four.

## Will History Repeat?

THE last two steps, particularly the fifth, present difficulties which will not be surmounted easily. The chief obstacles, unless history fails this once to repeat itself, will be state regulatory and administrative agencies. They are jealous of their authority and hold themselves in no mean regard, a feeling that is doubtless justified in a number of instances. They are resentful of anything remotely resembling interference—and suggestions no matter how constructive or how practical, or how steeped in logic, seem to fall in that category.

However, this first venture on the long, long trail to legislative uniformity, may stand a better chance of success because it deals with safety than would, for instance, a venture dealing with sizes and weights or with registration fees and taxes. Safety has a popular appeal today and bureaucratic opponents might find it embarrassing to defy the public opinion that certainly can be aroused in support of safety regulations applying to commercial vehicles, particularly if they have Federal sanction.

Furthermore, the chances are enhanced rather than lessened because the proposed safety regulations have not been formulated arbitrarily. The opposite is true. They were formulated as the result of consultations with 23 organizations representing groups directly interested, the list including all automotive organizations. The regulations, in their proposed form, appear to be comprehensive. They appear to be reasonable. They do not appear to be onerous. They reveal a desire not to work sudden hardships on operators. They are divided broadly into four parts: Qualifications of Drivers; Driving of Motor Vehicles; Parts and Accessories Necessary for Safe Operation; and Reporting of Accidents.

## Much Ado About Drivers

WE gather from various sources that the section dealing with Qualifications of Drivers is likely to be the most severely attacked at the public hearing. The chief objection seems to be that the regulations prescribed constitute an unwarranted interference with management; that they are more managerial than regulatory.

The validity of this objection is something which we need not discuss here. Transcending this point in importance

is the recognized fact that the driver is the first and foremost factor to be considered in approaching the problem of motor vehicle safety. And the problem is not solved unless the qualifications are specifically prescribed and unless they bar the incompetents, whom unscrupulous employers will always be ready to exploit. If these qualifications were based on standards which only highly skilled, very intelligent, perfect specimens of manhood could meet, they would deserve violent criticism.

## Common Sense Standards

ACTUALLY the standards are not high; they are merely common sense standards by which well-managed fleets already abide, and which no fleet should find objectionable if it sincerely desires to promote highway safety. Briefly, here they are:

Good physical and mental health; no physical deformity or loss of limb likely to interfere with safe driving; good eyesight in both eyes with or without glasses; ability to distinguish red and green colors; adequate hearing; competency to operate safely the type of vehicle or vehicles which he drives; knowledge of I. C. C. rules and regulations pertaining to safe driving; not addicted to narcotic drugs; refrain from drinking alcoholic liquors or beverages on duty and not make excessive use thereof off duty; not less than 18 years of age; ability to read and speak the English language unless he was engaged in driving on the effective date of the regulations or within one year prior thereto; 21 years of age with the same reservations as in the case of language, but in no case less than 18 years of age.

Those are common sense qualifications which should be prescribed, and which should be enforced if the safety problem is to be properly tackled.

No operator can reasonably object to them as a hardship.

A safety program that neglected them, would lack a reasonable appreciation of the most vital element in a very vital problem.

It is to be hoped that common sense will prevail at the public hearing.



## Shop Hint\$

**SHOP HINTS** in this issue are: Rear Bumper for Trucks, Counter Sunk Bolts, Blowing Nozzle, Electric Floor Scrubber and Electric Eye for Garage Doors.

Let's have your shop tricks. Commercial Car Journal will pay \$5 for each idea accepted. Just give us the details in your own language and we'll dress them up. Sketch your ideas roughly if you can't send a snapshot.

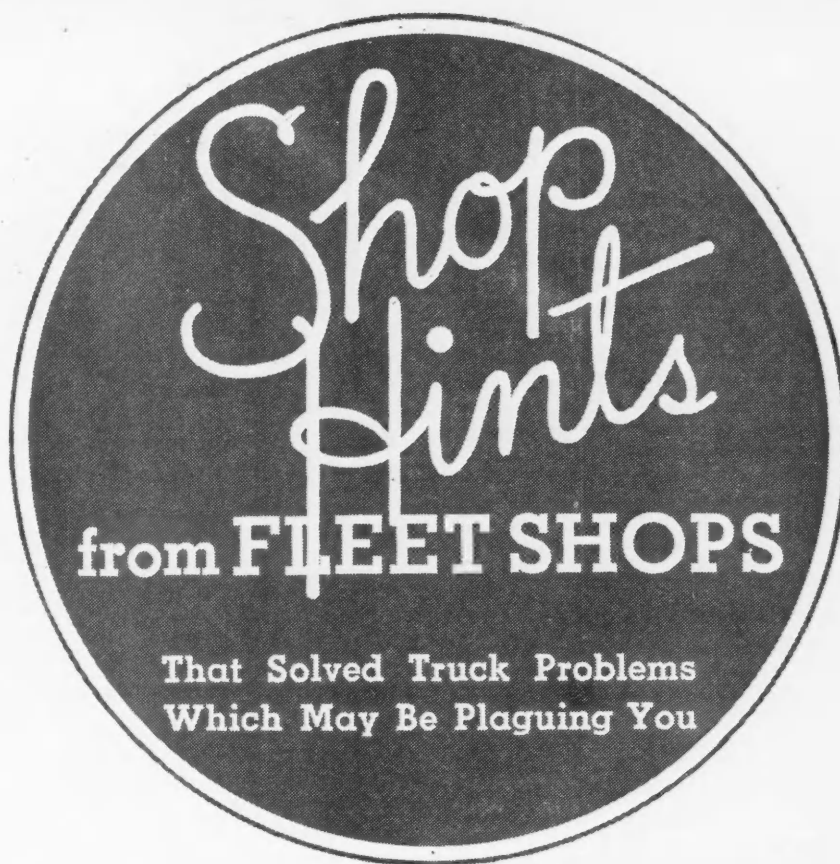
By Billie Burgan

Hage's Ice Cream Co., San Diego, Cal.  
Rear Bumper for Trucks

A VERY satisfactory rear bumper can be made by bolting two members, photo (1), to the rear of the chassis frame. These members are bent so that the bumper is 1 in. higher than the front bumper with the truck empty. The bumper itself is a 4-in. channel mitred, welded and bolted to the supports. In addition to the channel there is a step plate welded to the bumper top. The overall dimensions are: length, 4 ft. 6 in., width, 6 in., thickness, 3-16 in. There is a 3-in. lip turned up at the edge of the step nearest the front of the truck. A load brings the whole assembly down to front bumper height.

### Counter Sunk Bolts

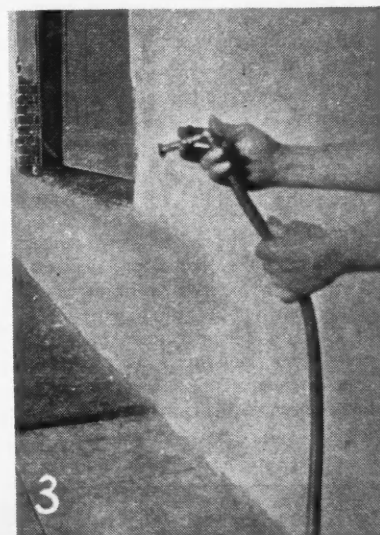
**B**ODY bolts or bolts for any purpose and with any description or size of countersunk head can be made by first shaping a pattern in an old sash weight and then heating a long bolt with the head removed by a blow torch. When the bolt is bright red it can be hammered down into the pattern thus forming the desired shape.



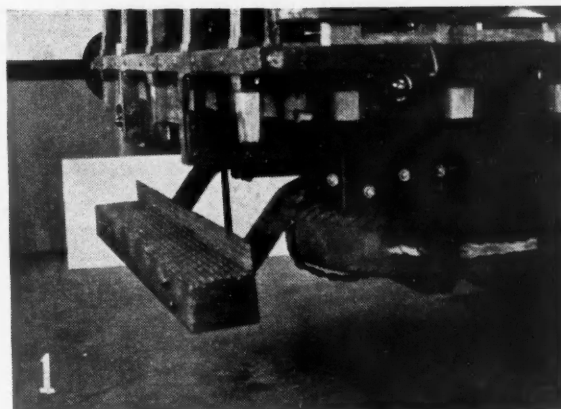
### Blowing Nozzle

**W**E have found that we can use discarded inner tube valves with the insides removed to good advantage. Held in the position shown in the illustration they can be used for any blowing operation. Thus the necessity for an extra hose or a blowing nozzle to replace the regular chuck is eliminated as well as the time necessary for changing them. The old style flange makes an excellent finger grip for holding the nozzle and directing the air stream.

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Illustrations are of: (1) rear bumper for trucks; (2) making counter sunk bolts; (3) blowing nozzle



COMMERCIAL CAR JOURNAL  
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## USL Truck Battery

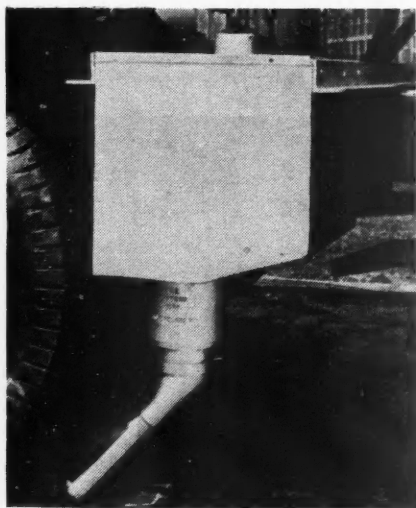
USL Battery Corp., Niagara Falls, N. Y., offers a USL battery specially designed for commercial service. The batteries boast heavier plate grid, 70 per cent thicker plates, the USL Durabar separators which prevent battery failures through short circuits and a heavier, hard rubber case. The battery is constructed with vent plugs twice the usual distance between posts to prevent corrosion. Cells are direct-connected through partitions inside the case resulting in shorter circuit path and higher voltage delivery.

## Lintern Sanders

THE Lintern Corp. of Cleveland offers an air operated and an electric sander for attachment to trucks and trailers as a protection against skidding, for quicker stopping and starting and better tire life. Both units spread sand by gravity. Valve operation, however, is by air or electric control.

The complete equipment consists of two sander valves (one for each drive wheel), distributors (for single or dual wheels) and operating button. The Hopper should be constructed and installed by local body shop. This sander valve is furnished for six volt operations. In case of twelve volts, two six volt sanders are connected in series. The sander pulls a maximum of nine amperes at six volts and four and one-half amperes at twelve volts. It operates efficiently even when the battery is low.

Both of these units offer a valuable feature for emergency driving in that the sand operating device can be so connected to the foot brake that a pressure of the foot on the brake results in the flow of sand or cinders. A switch with an indicator light on the instrument panel board controls this hook-up. This automatic sanding arrangement is ideal for driving under continuous bad weather conditions.

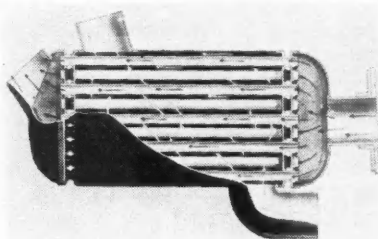


# New Products

Descriptions of the Latest Items Put on the Truck Market by Equipment and Specialty Manufacturers

## Heater and Defroster

HOUDE Engineering Corp., Buffalo, has perfected a hot-air heater and windshield defroster with several novel improvements. The heating unit is made of the "Houdizing" bonding process. The outstanding de-



velopment is the addition of the defroster unit controlled by a separate dash button. This control directs a stream of hot air through a slot in the windshield molding, spreading it fanwise across the windshield. The heater unit draws in outside air, circulates it through the seamless heater unit and passes the heated air into the cab.

## Scot Compressors

AIR compressors for service shops and garages in stationary and portable models driven either electrically or by gasoline are being offered by the Scott Air Compressor Co., 4674 Mulberry St., Philadelphia. Compressors range from the single-stage vertical and horizontal outfits to the two-stage vertical and horizontal units of various capacities.

## Light Truck Jack

ANTICIPATING the needs of operators of light trucks. Hein-Werner Motor Parts Corp. introduced a new 2-ton light truck special hydraulic jack for Ford, Chevrolet.

This new model will handle all light trucks. Model 2.95A is tested at 1½ times its rated capacity of 2 tons. Has 7-in. lift to total height of 16½ in. List price: \$5.95. For complete information write the Hein-Werner Motor Parts Corp., Waukesha, Wis.

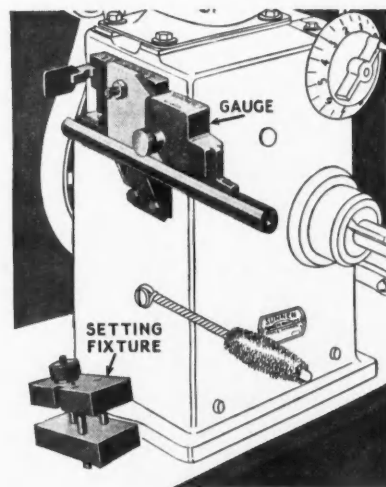
## National Hack Saw

NATIONAL Machine and Tool Co., Jackson, Mich., has announced a new style hack saw that is said to be adaptable for use in splitting bushings, cutting gas and oil lines and for use in any place in which space is limited. It works in a ¾-in. hole. Price of frame and one blade is 75 cents.

## Pin Fitting Gauge

A NEW de luxe pin fitting gage that takes the "guess" out of pin fitting jobs is announced by Sunnen Products Co. of St. Louis, Mo. The gage is a combination unit consisting of a setting fixture and a gage that will handle all size holes from 0.720 in. to 1.750 in. in diameter.

Two of the pins to be fitted are inserted in the setting fixture, and the setting fix-



ture in turn, is used to set the gage to the exact pin size. The piston can be slipped on the gage quickly during the fitting process and the scale (graduated in thousandths) will indicate just how near the hole is approaching a fit or the exact amount of clearance that has been allowed for the fit.





### Luber-Fine Oil Refiner

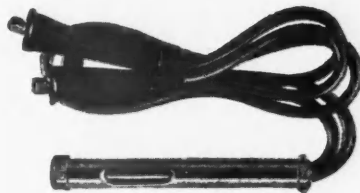
LUBER-FINER, Inc., has placed on the market a small, compact oil refiner for automobiles, trucks, tractors and all internal combustion engines. This device, known as Luber-finer, is said to completely refine crank case oil every minute that the engine is running. Luber-finer completely refines, renews, purifies and decolorizes the crank case oil while the car or truck is being driven. Foreign substances, such as dirt, particles of metal and dust are removed as well as the carbon-forming elements and other impurities that cause oil contamination. It permits free evaporation of dilution from the crank case at operating temperatures, at the same time lowering the engine operating temperature.

The Luber-finer is available in automobile and truck types—one for crank case

is forced through the heart of the Luber-finer, which is composed of refining material (D) which is contained in the perforated cylinder (E) and then into the cylindrical space (F). It then follows the upward path to the outlet opening (G) and thence back to the crank case. Before it can reach the opening (G) it passes through the fine mesh wire cloth (H).

### Synchronizing Lamp

A FLYWHEEL synchronizing lamp, designed for work under even the difficult



conditions, has recently been placed on the market by Shurhit Products, Inc., Waukegan, Ill. The lamp is encased in a 7/8-in. diameter nickel-plated tube. Heavy secondary cable lead goes to number one spark plug, and smaller diameter cable grounds to engine or car frame.

### Hansen Hinge

THE Hansen continuous hinge offers a solution to the stock problems confronting shops where heretofore it was necessary to stock many lengths of piano-type hinges before stocks were considered complete. Now one hinge length serves the purpose formerly served by many hinges of various lengths.

The Hansen continuous hinge is made in standard 12-in. lengths which may be easily fastened together into a solid hinge of any length. No other lengths need be carried in stock for all hinge requirements. For odd lengths, the last unit may be cut to the required length. This new hinge is made by A. L. Hansen Mfg. Co., Chicago.

### Battery Analyzer

A NEW battery analyzer which is said to not only test the condition of the battery, but show the per cent of useful plate life remaining, has been announced by the Allen Electric and Equipment Co., Kalamazoo, Mich. The analyzer is equipped with moving coil motor adjustment to battery temperature, adjustment for plates per cell, individual coil testing facilities and is finished in two-tone panel.

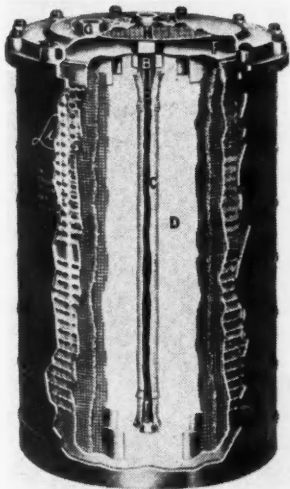
### Prep-Sol Cleaner

PREP-SOL has been chosen as the name of the cleaner formerly known as Sol-Kleen, which is for use by refinishers of automotive equipment to clean and prepare old synthetic finishes for repainting. Prep-Sol is a du Pont product.

### Weidenhoff Analyzer

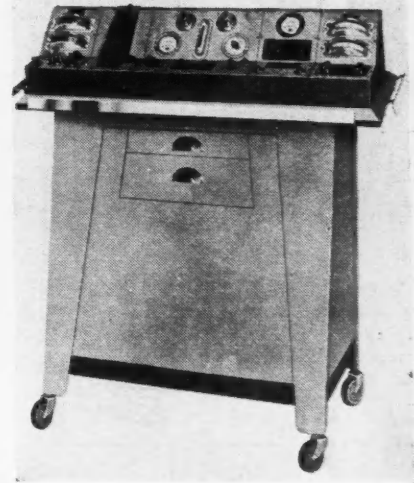
JOSEPH WEIDENHOFF, INC., Chicago, Ill., has announced a new motor analyzer, the test instruments of which are in removable units. This makes it possible for a repair shop to purchase one instrument at a time and gradually build up to a complete analyzer. It is calibrated on the "Go and No Go" principle, the instruments are said to be easy to read, and to present an extremely accurate report of existing conditions in the engine. The complete analyzer sells for \$196.25; when purchased in single units, the stand, without units, is \$26.50; unit No. 1, which is the vacuum, compression and spark plug test unit, \$37.50; unit No. 2, containing voltmeter, ammeter and rheostats, \$34.75; unit No. 3, the coil tester, \$48.50; unit No. 4, for testing condensers, radio suppressors and for resistance tests, \$24; unit No. 5, containing a manometer for testing muffler back-pressure, fuel pump pressure and suction, and float valve needle, \$25.

(TURN TO PAGE 55, PLEASE)



capacities up to 7 qt. and the other for 7 to 12 qt. capacities.

In operation used oil from the crank case enters the Luber-finer at the top (A) and flows through the center perforated tube (B) which is covered with a protective covering of porous, fibrous material (C) and under normal engine pressure it





**T**HE Walter Motor Truck Co., Ridgewood, L. I., announces a new six-wheeler model with several unusual features of construction.

This six wheel truck drives four wheels, distributing the drive to the front axle and the rear axle of the rear bogie, so as to provide a maximum spread between the driving points.

The new unit embodies the Walter four point positive drive that is obtained through the use of torque proportioning differentials.

The rear axle bogie is of unusual construction, and provides parallel wheel motion the same as independently sprung wheels used today on automotive vehicles. The wheels on the one side can tilt and rock without any motion, either vertically or otherwise, to the wheels on the opposite side.

This results in keeping all the four wheels in contact with the road at all times. This bogie is marked by the absence of radius and torque arms, and multiplicity of joints and connections. There is only one cross axle,

and that is a large tube located between the two rear wheels.

The unit is characterized by the setback front wheels, providing a shorter wheelbase for easier maneuvering and

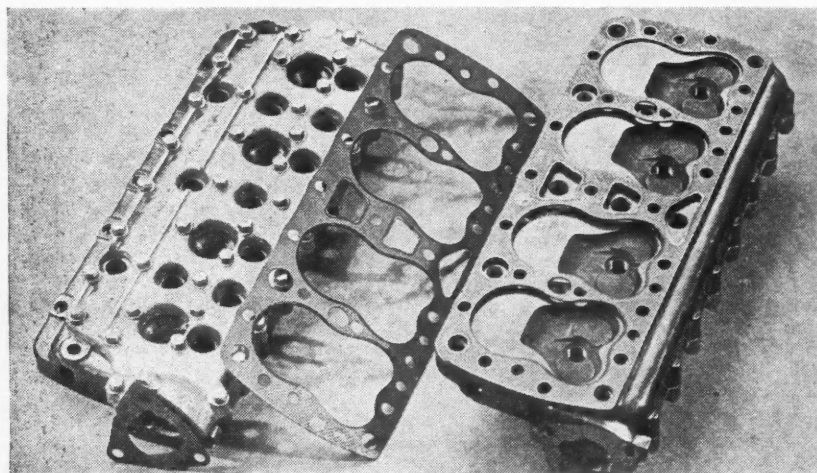
a better weight distribution.

The frame is of a drop type, being entirely straight behind the cab, without kick-up over the rear bogie and with a loaded height of 30 in.



Walter 6-wheeler model which drives four wheels

## Walter 6-Wheeler Drives Front Axle and Rear Axle



Federal-Mogul's copper alloy cylinder heads called Thermo-Flow

## Copper Alloy Heads for Fords Give More Power

**F**EDERAL-MOGUL CORP., Detroit, Mich., is offering to owners of Ford V-8 cars and trucks a new type of cylinder head which is claimed to increase the power of the engine and its fuel economy. This head is made in two parts; the lower part, which forms the wall of the combustion chamber, is made of a heat-treated copper alloy called Thermo-Flow, which is said to combine great tensile strength with high heat conductivity. The upper

part, which forms the jacket wall or cap, is normally made of aluminum, for the sake of lightness, but in the case of marine engines, where the corrosive effect of salt water on aluminum may prove an objection, it can be made of cast iron. These two parts are held together by a special set of screws, and the joint need never be broken. The composite head is held in place on the cylinder block by the regular cylinder-head studs, but these pass through the

lower part only. The Thermo-Flow alloy is claimed to have a heat conductivity two-and-one-half times that of aluminum, and to make possible the use of still higher compression ratios.

Results of tests made with a Ford V-8 engine with cast iron, aluminum and Thermo-Flow heads respectively have been issued by the Federal-Mogul Corporation. With the standard aluminum heads a compression ratio of 6.3 was used and with the Thermo-Flow head a ratio of 7.75. No figure is given for the compression ratio used with the cast iron heads, but the measured compression pressures were 90, 112, 6 and 134.2 lbs. per sq. in. for the iron, aluminum and Thermo-Flow heads respectively. Horse power curves show that the engine developed 84.5 hp. with cast iron cylinder heads, 91.5 hp. with aluminum and 107 hp. with Thermo-Flow cylinder heads. An over-all reduction in fuel consumption of 10 per cent was found in the dynamometer tests which extended over a wide speed range, comparing Thermo-Flow with aluminum; comparing with the cast-iron head, an average improvement of 16.2 per cent was obtained.

A comparative road test was made with a standard Ford tractor with trailer in service between Detroit and Buffalo, with cast iron and Thermo-Flow cylinder heads respectively. In 1500 miles of operation (two round trips) 268 gallons of gasoline were burned with the cast iron heads and 217 with the Thermo-Flow heads, which represents a saving of 19 per cent.



# COMMERCIAL VEHICLES

● Most important of all, these batteries are of characteristic Exide quality, backed not only by nearly fifty years of battery-building experience, but by long study of actual operating conditions with commercial fleets in all parts

of the country and in every industry.

The new line of Exide Commercial Types covers the entire range of operating conditions, and is designed for the requirements of more than 90% of all commercial vehicles. No longer need the commercial operator depend on passenger-car batteries. For large trucks, there is the regular heavy-duty Exide line that has made an outstanding record of dependability and economy in the hardest service throughout the country.

Write us for the name of the nearest Exide Wholesaler, who will give you complete details on the new line of Exide Commercial Type Batteries.



Exide Type XHMR-17,  
capacity 135 A. H. at the 20-hour rate

## Exide COMMERCIAL TYPE BATTERIES

THE ELECTRIC STORAGE BATTERY CO., Philadelphia  
*The World's Largest Manufacturers of Storage Batteries for Every Purpose*  
Exide Batteries of Canada, Limited, Toronto

COMMERCIAL CAR JOURNAL  
SEPTEMBER, 1936

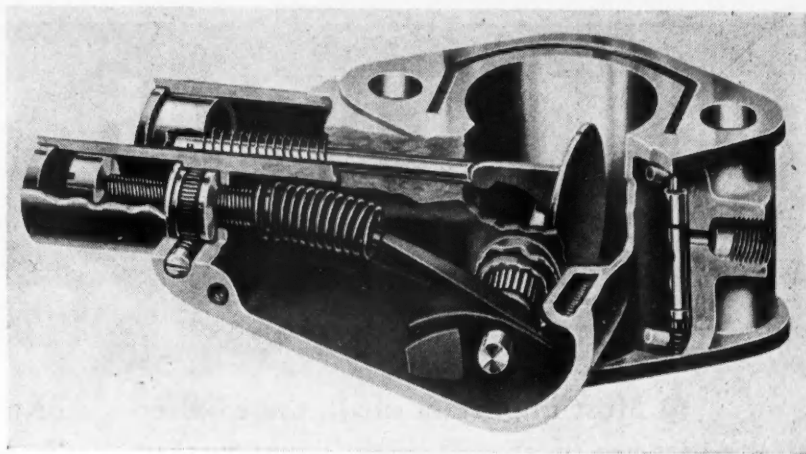


Exide Type XHMR-19,  
capacity 152 A. H. at the 20-hour rate



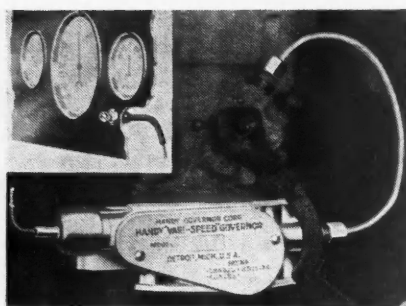
**A** NEW universal type governor known as the Vari-Speed type V-5 is announced by the Handy Governor Corp. It is a governor that can be adjusted to any desired speed. The new model is universally adaptable to all engines requiring or using 1¼ in. carburetors.

The V-5 governor has the exclusive cam control for properly co-relating velocity and vacuum forces. A controlling spring together with the cam establishes a balance that provides accurate and exact governing. The device cannot be made to vary by manipulation of throttle or other controls and provides accurate governing over a wide range of speeds. Engines requiring or using vacuum spark advance are provided for by the exclusive advance control built into the governor. This retains the



Cutaway view of Handy universal governor. Below left—Showing the dash control hook-up

## New Handy Governor is Adjustable to Any Speed



proper spark advance on the engine and contributes to operating fuel economy.

The adjustment provided on the Vari-Speed governor not only controls the effective length of the spring but changes its characteristics as the speed adjustment is changed. Thus by means of the adjustment the effect of an infinite number of springs is given with only one spring and exact synchroni-

zation of the spring with the governor characteristics is obtained.

Three types are provided—a conventional with a standard sealing cap. The second type has a lock adjustment in which a key is used instead of the seal. The third is a remote control unit attached to the dashboard. With the V-5, a remote control tube from the governor to the dash with a lock and key on the dash is supplied extra.

## New Truck Registrations by Makes by Months

	Autocar	Brockway	Chevrolet	Diamond T	Dodge	Federal	Ford	G. M. C.	International	Mack	Reo	Sterling	Stewart	Studebaker	White-Indiana	Miscellaneous	Total
January.....1936	75	94	15,124	495	6,207	223	14,606	428	4,743	90	339	8	85	143	493	607	43,760
January.....1935	71	86	9,867	550	5,141	152	13,260	858	3,513	114	380	10	42	127	308	280	34,759
February.....1936	57	88	14,978	510	5,556	170	12,226	758	4,365	107	217	4	62	134	408	661	40,301
February.....1935	41	54	11,701	499	3,271	113	14,330	570	3,174	63	292	10	34	107	217	321	34,797
March.....1936	88	127	19,511	634	6,753	205	16,168	1,551	5,395	184	264	17	73	221	477	762	52,430
March.....1935	56	67	13,744	534	4,284	132	16,805	850	3,673	100	389	14	60	135	258	410	41,511
April.....1936	121	179	23,323	784	8,818	271	18,497	2,733	7,308	289	379	21	112	327	700	1,099	64,961
April.....1935	79	109	15,024	568	5,708	177	17,943	870	4,554	159	449	31	62	189	309	554	46,785
May.....1936	109	168	21,443	754	8,507	275	17,971	3,045	6,704	440	399	16	116	358	719	1,159	62,183
May.....1935	78	97	16,284	570	5,381	193	17,591	883	4,807	189	616	5	60	229	294	691	47,968
June.....1936	96	137	19,045	660	7,777	287	16,930	2,820	6,151	427	325	28	113	320	599	1,136	56,851
June.....1935	73	113	17,576	572	4,911	178	17,385	901	4,710	103	439	16	69	218	258	721	48,243
Six Months 1936.....1936	546	793	113,424	3,837	43,618	1,431	96,398	11,335	34,666	1,537	1,923	94	561	1,503	3,396	5,424	320,486
Six Months.....1935	398	526	84,196	3,293	28,696	945	97,314	4,932	24,431	728	2,565	86	327	1,005	1,644	2,977	254,063
% Change 6 Months.....	+37	+51	+35	+17	+52	+51	-1	+130	+42	+111	-25	+9	+72	+50	+106	+82	+26





"I thought I had the oil cost problem run down and treed.

"I compared prices per gallon... made some figures on a piece of paper... and deliberately went out and bought a lot of cheap oil for my fleet.

"Wrong? I couldn't have been more wrong if I'd been the one who told Noah that it wasn't going to rain! That cheap oil turned around and bit me right where it hurts most—in the pocketbook!

"Sure—I saved a few cents a gallon on the purchase price. But—that cheap oil formed a blanket of carbon in my cylinders. It choked up the oil lines with gum and sludge. It made the engines overheat

and caused excess wear. And it got so thin that on long hauls it just laid down and died! So I decided it was high time to bark up the *right* tree. For only a little more per gallon, I got Gulfube—a *real* premium oil. From that day on, my maintenance costs took a nose dive. My hat's off to Gulf for what the Multi-sol process has done for Gulfube—and me!"

*Gulfube is a premium-quality oil selling at non-premium prices. It cuts repair bills to the bone—because Gulf's exclusive Multi-sol refining process strips it clean of carbon, gum and sludge-forming compounds. It flows more freely in cold—stands up better under heat—and has an extra high viscosity index.*

## GULFLUBE MOTOR OIL



COMMERCIAL CAR JOURNAL  
SEPTEMBER, 1936

If you are a fleet owner, fill out the coupon below. It will bring you the complete Gulf story—how Gulfube can mean real savings to you. Mail the coupon today!

THIS OFFER CAN SAVE  
YOU MONEY!



GULF, 3800 Gulf Bldg., Pittsburgh, Pa.

Gentlemen:

I should like to get the complete money-saving story on Gulfube.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_



# News

## SUMMARY of the Past Month

### July Sales Up 21%

#### Production Ahead 15%

Sales of new trucks and commercial cars in the United States during July were estimated by R. L. Polk & Co. at 62,000 units, with the possibility that the all-time record of sales in one month, 64,961, in April, 1936, may be exceeded. The largest July sales in history were in 1929 with 57,943 units. The 62,000 estimate is based on complete registrations in 21 states. July registrations represent a gain of 21 per cent over the 51,243 units sold in July, 1935.

July output this year amounted to 70,880 units. This is an increase of 30 per cent over the 61,582 units produced in July, 1935.

#### Benson Is NADA Gen. Mgr.

A. N. Benson, who succeeded the late Jack Frost in April as executive head of the National Automobile Dealers Association with the title of assistant to the president, has been named general manager of the association. Previous to his NADA connection, Mr. Benson was general manager of the Minnesota dealers' association.

#### ATA Convention October 19-21

The third annual convention of the American Trucking Associations, Inc., will be held in Chicago at the Hotel Stevens October 19, 20 and 21. William E. Lee, Interstate Commerce Commissioner and a member of the Motor Carrier Division, will be one of the principal speakers. More than 2000 truck operators are expected to attend.

#### FWD Promotes Roberts

Chester J. Roberts, who has been connected with the Four-Wheel Drive Auto Co., at the main plant in Clintonville, Wis., has been appointed manager of his company's Milwaukee branch.

#### Armstrong Quits NHUC

R. S. Armstrong has resigned from the National Highway Users Conference. For a number of years he handled legislative work for the Conference.

#### William I. Ralph

William I. Ralph, whose life, for nearly 40 years was devoted to activities connected with automotive business paper publishing, died on Aug. 3 at Atlantic City.



He began his career in the publishing field as a subscription solicitor for *The Automobile*, one of the forerunners of *AUTOMOTIVE INDUSTRIES*, in 1899. When *The Automobile* was bought by the late H. M. Swetland in 1902, and the *Class Journal Co.* was organized, "Bill" continued with the publication in the capacity of subscription representative. His success with the company earned him a place in the advertising department and his accomplishments soon won for him a vice-presidency in the company, in which capacity he continued with the *Chilton Co.* until his death.

#### Contract Carriers Must File Contracts By Oct. 1

An order requiring contract carriers under the Motor Carrier Act to file copies of all contracts on or before Oct. 1, has been issued by the ICC. This is the result of charges that numerous common carriers were posing as contract carriers in an effort to avoid more rigorous rate regulation.

#### Timken Axle Adds Plant

The Timken-Detroit Axle Co. will add to its manufacturing facilities about September 1 by establishing a new plant at Waukegan, Ill. The Waukegan factory, to be known as Plant 5, will be operated as a department under the supervision of the company's Wisconsin Axle Division.

#### Taylor Is Bendix Adv. Mgr.

Neal Taylor Hall has been appointed advertising manager of the Bendix Products Corp., South Bend, Ind.

[Additional News on p. 104]



Edward F. Coogan, who has been appointed assistant sales manager of the Autocar Co. at Ardmore, Pa. He was formerly Philadelphia branch manager to which position he is succeeded by James E. Higgins



Al Stratton, who has been appointed Southwestern representative, with headquarters in Kansas City, Mo., for the Timken-Detroit Axle Co. He will contact vehicle manufacturers and Timken distributors

#### Reo Announces Changes

George E. Smith, vice-president and purchasing manager, has been named assistant general manager of the Reo Motor Car Co. Domestic sales activities of the company have been transferred to the Reo Sales Corp., under Elijah G. Poxson, president, who now will have charge of both foreign and domestic sales.

A number of other personnel changes have been made. C. A. Triphagen, formerly sales manager, has resigned, while T. F. Cullen has been named advertising manager, and Charles Boutelle has been placed in charge of domestic sales under Mr. Poxson.

#### Erie Malleable Reorganizes

Following the termination of the receivership on July 24, the Erie Malleable Iron Co. effected reorganization with the following officers: Enoch C. Filer, president; C. G. Strickland, vice-president; J. H. Redhead, executive vice-president and general manager; R. H. Eisenlord, secretary and treasurer. Directors are Archibald Brown, C. H. English, E. C. Filer, R. H. McCarter, A. W. Mitchell, J. Roebing and C. G. Strickland. Offices will be maintained in New York City, Chicago, Pittsburgh, Philadelphia and Oakland, Cal., with sales representatives in other cities.

#### Longyear Upped by Reo

Frank D. Longyear has been promoted to the post of production supervisor for the Reo Motor Car Co. For several years past he has been superintendent of the material control division.

#### Darling and Slater Go West

Gordon M. Darling has been appointed by the Magnus Chemical Co., Garwood, N. J., as California representative. Fred Slater will represent Magnus products of soaps and cleaners in Oregon and Washington.



# "WE'VE GOT THE SAME ENGINES...HOW COME I USE MORE GAS?"



"What did she need?"

"18 gallons."

"Huh, mine took 20 . . . how come I use two gallons more gas with the same engine and the same load?"

"Motor acting up?"

"Nope. Sounds about as sweet as it ever did."

"Mine was sour on mileage last month, too. One day a Standard Oil engineer made a check-up of our fleet and uncovered a lot of leaks we didn't know we had. Nothing serious or we'd have caught it ourselves. Well, our mechanics tuned those engines like the engineer recommended and we're all getting better mileage."

"Sounds worth telling my super about. What'd he charge?"

"Not a red cent—it's a free service. Guess Standard figures good service and good gas go together."

**T**HAT conversation between two fleet men tells our story perfectly. Differences in fuel consumption between identical engines is a subject close to every fleet man . . . particularly close to those whose engines have, for no noticeable reason, turned into gluttons.

Many fleets have brought down their cost-per-mile expenses—some as much as 21%—by using Standard Oil Service. Give your local Standard Oil (Indiana) office a call, and "tune-up" for bigger profits.

**STANDARD OIL COMPANY (INDIANA)**

910 SOUTH MICHIGAN AVENUE • CHICAGO, ILL.



**STANDARD OIL PRODUCTS: ISO-VIS "D", • Standard Transmission Oil (Summer and Winter Grades) • Standard Heavy Duty Gear Grease • Standard Wheel Bearing Grease (Medium and Heavy) • Standard Fibre Grease (for Universals) • Standard Pressure Gun (Medium and Heavy) Standard Water Pump Grease.**

Copyright 1936, Standard Oil Co

## STANDARD OIL COMPANY (INDIANA)



## Diesel and Gasoline Operating Cost Study

(CONTINUED FROM PAGE 15)

totals would be meaningless, since neither all of the highs, nor all of the lows were experienced by any one company.

In Table 3 is given a detailed breakdown of expense item C-33, maintenance of vehicles. All three tables are self-explanatory. Certain of the expense items, however, require discussion and amplification.

**DRIVERS'** wages are shown as a fixed expense at 75 cents per hour, for 250 days per year, at 12 hours per day. The average driver's wages per mile for all companies amounts to \$.03491, which is the charge to be used if drivers' wages are treated as a variable cost. It is obvious however, if drivers' wages are treated as a variable and erroneous result is obtained for short hauls. As an example—the trucks operating exclusively on short hauls of 5 miles averaged three round trips per day, traveling a total daily mileage of 30 miles, yielding a salary at the stated rate per mile of only \$1.05 per day. This inconsistency is avoided if drivers' wages are carried as a fixed cost per day up to 60,000 miles per year and as a variable charge above 60,000 miles per year.

The same objection applies to depreciation of vehicles when handled as a variable. If the equipment is assigned an economic life of 400,000 miles, is

worked exclusively on short hauls and averages only 30 miles per day, the equipment would operate for 53 1/3 years before being written off. This inconsistency is not rectified by regarding depreciation of vehicles as a fixed charge. Where various lengths of hauls are involved, depreciation of vehicle cannot be properly assigned to the respective hauls unless each length of haul is treated as a particular problem. Depreciation rate varies with the length of hauls and cannot be calculated properly for any given length of haul, if it be treated as a direct variable per mile or as varying inversely with the mileage traveled, as do the fixed charges. Depreciation is treated in Table 1 as a variable charge. Since all of the trucks included in the study averaged 47,000 miles per year this rate of depreciation is insufficient for the trucks operating in short hauls and must be adjusted as shown further on in this article.

**TIRE** costs, of the various companies, consists of an arbitrary charge per month for tires at a given rate per mile, or at some fixed sum per month. There was a great variation as between companies in the cost of tires per mile, due primarily to the method used to get tire cost into expense. The tire cost per mile shown in Table 1 is the result of a test conducted by the writer, to determine tire expense per mile.

Tires are designed and manufactured to produce satisfactory results when used under definite recommended conditions. Any diversion from these conditions reflect in mileage and performance.

[TURN TO PAGE 46, PLEASE]

TABLE 5

Showing Estimated Useful Life in Miles and Years for Various Truck Miles Per Year Also Depreciation Per Year Based Upon Net Investment Shown After Deduction of Tires and Salvage

Miles Run Per Year	CASOLINE TRUCK—\$6215			CUMMINS DIESEL TRUCK \$7355			TRAILER—\$2236		
	Miles Life	Years Life	Depreciation Per Mile	Miles Life	Years Life	Depreciation Per Mile	Miles Life	Years Life	Depreciation Per Mile
5,000	40,000	8.0	\$.15535	40,000	8.0	\$.18368	40,000	8.0	\$.05590
10,000	80,000	8.0	\$.07768	80,000	8.0	\$.09194	80,000	8.0	\$.02795
15,000	120,000	8.0	\$.05179	120,000	8.0	\$.06129	120,000	8.0	\$.01863
20,000	160,000	8.0	\$.03884	160,000	8.0	\$.04597	160,000	8.0	\$.01398
25,000	200,000	8.0	\$.03108	200,000	8.0	\$.03677	200,000	8.0	\$.01118
30,000	240,000	8.0	\$.02589	240,000	8.0	\$.03065	240,000	8.0	\$.00932
35,000	280,000	8.0	\$.02219	280,000	8.0	\$.02627	280,000	8.0	\$.00799
40,000	320,000	8.0	\$.01942	320,000	8.0	\$.02298	320,000	8.0	\$.00698
45,000	360,000	8.0	\$.01726	360,000	8.0	\$.02043	360,000	8.0	\$.00621
50,000	400,000	8.0	\$.01554	400,000	8.0	\$.01839	400,000	8.0	\$.00559
55,000	400,000	7.3	\$.01554	440,000	8.0	\$.01672	440,000	8.0	\$.00508
60,000	400,000	6.7	\$.01554	440,000	7.3	\$.01672	480,000	8.0	\$.00466
65,000	400,000	6.2	\$.01554	440,000	6.8	\$.01672	480,000	7.4	\$.00466
70,000	400,000	5.7	\$.01554	440,000	6.3	\$.01672	480,000	6.9	\$.00466
75,000	400,000	5.3	\$.01554	440,000	5.9	\$.01672	480,000	6.4	\$.00466
80,000	400,000	5.0	\$.01554	440,000	5.5	\$.01672	480,000	6.0	\$.00466
85,000	400,000	4.7	\$.01554	440,000	5.2	\$.01672	480,000	5.6	\$.00466
90,000	400,000	4.4	\$.01554	440,000	4.9	\$.01672	480,000	5.3	\$.00466
95,000	400,000	4.2	\$.01554	440,000	4.6	\$.01672	480,000	5.1	\$.00466
100,000	400,000	4.0	\$.01554	440,000	4.4	\$.01672	480,000	4.8	\$.00466
105,000				440,000	4.2	\$.01672	480,000	4.6	\$.00466
110,000							480,000	4.4	\$.00466

TABLE 2  
Fixed Overhead Cost Truck  
and Trailer Unit

ITEM	Cost per Day per Truck and Trailer Unit		
	High	Low	Average
Garage and yard rent	\$3.07	\$ .15	\$.82
Office Rent	.66	.04	.15
Maintenance building and tools	.24	.02	.04
Insurance (other than vehicle)	.34	.02	.16
Taxes (other than vehicle)	.43	.12	.28
Depreciation (other than vehicle)	.86	.04	.35
Salaries—terminal employees	1.80	.30	.60
Salaries—management & office	6.54	1.34	2.43
Salaries—solicitors	1.70	.08	.26
Telephone and telegraph	.66	.16	.35
Office supplies and expense	.48	.06	.13
Legal and auditing	.59	.03	.31
Claims—short and damage	.30	.00	.13
Miscellaneous	2.40	.27	.86
Total per day			\$ 6.89
Total per year (250 days) (Item B-15 Table 1)			\$1722.50

TABLE 3  
Cost of Maintenance Truck  
and Trailer Unit

ITEM	Cummins Diesel Truck	Gasoline Truck	8-Wheel Trailer
Pieces of equipment operated	80	161	241
Truck days operated	28,437	57,178	85,613
Miles operated	5,402,030	10,601,610	16,003,640
Expense items	Cost per Mile		
Grease and wash material	\$.00066	\$.00066	\$.00048
Grease and wash labor	.00087	.00087	.00051
Battery maintenance	.00051	.00017	
Repair and maintenance, tires and tubes	.00106	.00112	.00115
Repair parts and labor	.02801	.02809	.00603
Garage overhead	.00208	.00271	.00098
Total (Item C-33, Table 1)	\$.03319	\$.03362	\$.00915

TABLE 4

Showing Full Cost Per Mile for Truck and Trailer Unit for Various Truck Miles Per Year

Miles Run Per Year	COST PER MILE		Difference in Favor of Cummins Diesel
	Gasoline Truck and Trailer	Cummins Diesel Truck and Trailer	
5,000	\$1.41103	\$1.40596	\$.00505
10,000	.76031	.73983	.02048
15,000	.54350	.51777	.02573
20,000	.43500	.40677	.02823
25,000	.36994	.34014	.02980
30,000	.32659	.29575	.03084
35,000	.29556	.26403	.03153
40,000	.27238	.24022	.03216
45,000	.25425	.22173	.03252
50,000	.23981	.20693	.03288
55,000	.22940	.19486	.03454
60,000	.22068	.18612	.03456
65,000	.21658	.18200	.03458
70,000	.21308	.17847	.03461
75,000	.21005	.17541	.03464
80,000	.20739	.17273	.03466
85,000	.20503	.17037	.03466
90,000	.20294	.16827	.03467
95,000	.20107	.16639	.03468
100,000	.19939	.16470	.03469
105,000	.19786	.16317	.03469
110,000	.19647	.16178	.03469



# "WITH A LOAD VALUED AT \$85,000

## WE CAN'T TAKE CHANCES

### ON TIRES" Says J. Miller Lackey Manager, Selby Stud



## HOW NEW GOODRICH TRUCK TIRES ARE PROTECTED AGAINST SIDEWALL FAILURES

Moving valuable registered horses to and from show grounds, race tracks and polo fields is no small responsibility. Many horses are valued at \$20,000 to \$30,000 and it is not uncommon for one of the animals to be injured in transit.

To protect his champion Arabians, Mr. Roger A. Selby, President of the Selby Shoe Co., Portsmouth, Ohio, had a

tractor-trailer unit specially designed to reduce the risks involved in transportation. This unusual outfit is built to carry six horses, equipment and from two to six men.

To haul this precious cargo, Goodrich Silvertown Truck Tires are used exclusively. These tires are Triple Protected—built especially for the extra-tough hauling jobs.

They're first choice among truckers who have valuable loads—long hauls or any unusually severe service. It's because the new Silvertowns actually check 80% of premature failures! A revolutionary invention built into the sidewall guards against blow-outs and road delays. No other tire has this construction!

If you want to cut down the tire costs on any job, get the

tire used on the world's toughest hauls. It will do your job better, too. And

remember, Silvertowns cost no more than other standard tires.

### NOTICE TO OWNERS OF HALF-TON TRUCKS

Goodrich has a new kind of tire for half-ton trucks. It's the "Commercial 15"—a low-pressure tire with all the advantages of a truck tire and automobile tire combined. It cushions the load, gives greater mileage, blow-out protection and non-skid safety.

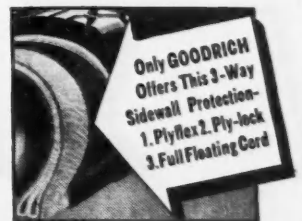
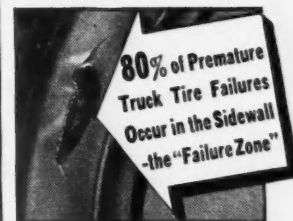
### HOW TRIPLE PROTECTION WORKS

**1 PLYFLEX**—a new, tough, sturdy rubber material with greater resistance to stretch. A layer of Plyflex in the sidewall prevents ply separation—distributes stresses—checks local weakness.

**2 PLY-LOCK**—the new Goodrich way of locking the plies about the bead. Anchoring them in

place. Positive protection against the short plies tearing loose above the bead.

**3 100% FULL FLOATING CORD**—Each cord is surrounded by rubber. With ordinary cross-woven fabric, when the cords touch each other, they rub—get hot—break. In Silvertowns, there are no cross cords. No friction.



© 1936, The B. F. Goodrich Co., Akron, Ohio.

# Goodrich *Triple Protected* Silvertowns

SPECIFY THESE NEW SILVERTOWN TIRES FOR TRUCKS AND BUSES

COMMERCIAL CAR JOURNAL  
SEPTEMBER, 1936



(CONTINUED FROM PAGE 44)

Branded tires were checked to determine their life under the following operating program:

1. A regular periodic check of alignment on both front and rear wheels was maintained, and misalignment corrected where found.

2. Brakes were periodically inspected and properly adjusted and equalized.

3. A periodic inspection of rims and base bands was maintained and bent flanges repaired.

4. A periodic inspection of tires was maintained and all necessary repairs were made at once. Boots were never used except in emergency cases.

5. Tires were regularly and properly inflated, usually each day.

6. The load supported by the tire was always under the permissible maximum load set by the factory.

#### Result of Test

##### New Tires

1. 194—38 x 7 tires ran a total of 13,261,114 miles or an average of 68,356 miles per tire.

2. 208—40 x 8 tires ran a total of 9,226,538 miles or an average of 44,358 miles per tire.

##### Retreads

3. 100—38 x 7 tires ran a total of 2,689,

040 miles or an average of 26,890 miles per retread tire.

4. 108—40 x 8 tires ran 2,307,846 miles or an average of 21,368 miles per retread tire.

#### Cost

Cost of 38 x 7—New ..... \$51.11  
Cost of 38 x 7—Retread ..... 14.07

Total ..... \$65.18  
Total miles per tire, new and retread—  
95,246

Cost per tire mile—\$.0006843

Cost of 40 x 8—New ..... \$71.94

Cost of 40 x 8—Retread ..... 15.89

Total ..... \$87.83  
Total miles per tire, new and retread—  
65,726

Cost per tire mile—\$.001336

\$.001336 x 10 = .01336 Item C-32, Table 1.

\$.000684 x 12 = .00821 Item C-32, Table 1.

All tire expense other than cost of new tires such as check of alignment, rims, inflation, tire changes, patching and repairing, is included in maintenance of equipment, Item C-33.

WITH the data contained in Table 1, it is possible to estimate, within a reasonable degree of accuracy, the cost of any particular haul or total cost per mile. It should be borne in mind that Table 1 deals only with costs for an average haul and that costs for hauls less than the average haul will be understated and cost for hauls greater than the average haul overstated, unless proper adjustments are made for depreciation and drivers' wages.

In order to compare the cost of diesel and gasoline equipment for varying truck miles per year, Table 4 has been compiled, showing cost per mile after properly equating depreciation and drivers' wages to the varying yearly mileages. For all yearly mileages, up to and including 60,000, drivers' wages are regarded as a fixed charge of 75 cents per hour, for 12 hours a day, as shown in Table 1. Above 60,000 miles per year, drivers' wages are regarded as a variable amounting to \$.0375 per mile, which is equal to 75 cents per hour, at 20 m.p.h.; a slight increase over the fleet average of \$.03491 but nearer in line with a proper wage scale. By this method high and low yearly mileages are all assessed the proper cost of drivers' wages. Depreciation is equated to the varying yearly mileages, as shown in Table 5. The trucks and trailers are assigned a life of eight years, as a maximum for all mileages under the economic life of the equipment. The economic life of the equipment is taken as 400,000 miles for gasoline trucks, 440,000 miles for diesel trucks and 480,000 miles for trailers. By this method the vehicles on short hauls are written off in 8 years, giving due consideration (TURN TO PAGE 48, PLEASE)

COMMERCIAL CAR JOURNAL  
SEPTEMBER, 1936

# "STURACO"

★★★★

## EXTREME PRESSURE ("E.P.") GEAR AND CHASSIS LUBRICANTS




### "A High Class Gear Lubricant Is Worth Every Cent It Costs!"

**KEEN TRANSPORTATION  
ENGINEERS SAY:**

Intelligently handled, the use of  
"STURACO" will save you money.  
Four consecutive years of road  
service by hundreds of thousands of  
vehicles prove it.

**ORDER TRIAL DRUM!**




### "STURACO" E.P. LUBRICANTS ARE THE ORIGINAL DEVELOPMENT OF D.A. STUART & CO. ESTABLISHED 1865 GENERAL OFFICES, 2727-2753 SO. TROY ST. CHICAGO, U.S.A. BRANCHES IN PRINCIPAL CITIES



# There's a DIFFERENCE between "CHEAP TIRES" and "CHEAP MILES"



**TWO ADDITIONAL FULL PLIES OF FABRIC MAKE THE GENERAL TRUCK TIRE 12% TO 23% STRONGER DEPENDING ON SIZE — WHEN YOU CAN GET THAT MUCH FOR ONLY THE LITTLE MORE THAT GENERALS COST — THAT'S REAL VALUE**



## GENERAL TRUCK TIRES



(CONTINUED FROM PAGE 46)

to obsolescence, and at the same time eliminating the 53 1/3 year inconsistency previously mentioned. The economic life assigned to the equipment in Table 5 is at slight variance, with Item A-14, Table 1. However, it is the nearest figure produced by the yearly mileage scale used in compiling the table.

TABLE 4 shows costs per mile for yearly mileages up to 110,000 miles. A few of the trucks operated over 100,000 miles a year and a very few, on short

hauls in the Los Angeles basin area, operated only 8000 miles per year. The fleet average was 47,000 miles per year per truck.

The chief lesson to be learned from Table 4 is that the savings accruing from diesel operation vary directly with the yearly mileages traversed. The greater the yearly mileage, the greater the saving. When a diesel truck is operated 5000 miles a year, the saving over gasoline operation is \$.00505 per mile, but if the truck operates a total of 110,000 miles a year, the saving will amount to \$.03469 a mile.

FLEET AFTER FLEET IS STANDARDIZING

ON AMCO. IT SEEMS TO BE THE ANSWER

TO THE MAINTENANCE PRAYER. TRY IT.

WRITE OR WIRE FOR INSTANT ATTENTION.



BLOCKS  
SHOES  
ROLL LINING  
SEGMENTS  
FOR TRUCKS  
BUSES AND  
TRAILERS

• ASBESTOS MANUFACTURING CO.

• HUNTINGTON • INDIANA •

Complete Truck Specifications Table Will Be Published in October

Line Number	MAKE AND MODEL	GENERAL (See Keynote)				TIRE SIZES		ENGINE DETAILS							TRANS-MISSION		REAR AXLE			FRONT AXLE		BRAKES					FRAME							
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B.	Gross Vehicle Weight with Max. Tires	Chassis Wt. (Stripped)	Standard Front and Rear	Maximum Tire Size	Furnished	Make and Model	No. of Cylinders, Stroke	Displacement	Comp. Ratio	Torque lb. ft.	Max. Brake H.P. at R.P.M.	Number, Diameter and Length	Main Bearings	Governor Standard	Make and Model	Forward Sp'ds	Make and Model	Clear and Type	Drive & Torque	Gear Ratio Range in High	Make and Model	SERVICE					C-A Dimension (Std. W. B.)	Side Rail Dimensions	Type
Make Location Type	Lining Area																										Drum Area	Drum Material	Hand Location Type					
1 Federal.....	11 3/4-1	505	128	152	505	7500	2950	6.00 20S	6.00 20	Her QXB3	6-3 3/4 x 4 1/4	205	5.2	134	57-2500	7-2 1/2 x 10 1/2	NWG T9	4	Tlm 51200H	SF	H 5.14-5.83	3.67-9.50	Own 20D	L41HV	L41H	250	632	1032	a	TX	51 1/2	7x2 1/4 x 3 1/4	T	
2 White.....	822H 8-10	***	185	Op	10500			11.25/20D	11.25/20	Own 460	6-4 1/4 x 5 1/4	460	5.0	320	123-2400	7-2 1/4 x 13 1/4	Y Own	4	Own 21C		4	Own 20D									TD	148	11 1/2 x 3 x 3/4	TD



Spark Plug Selection  
and Service

(CONTINUED FROM PAGE 19)

used where the operation is spasmodic or where there is a great deal of idling and low speed running.

There are a number of indications that show the close observer that too hot a spark plug is being used. Among them are broken porcelains, rapid gap growth and fused electrodes. A bubbly or blistered appearance of the porcelain which surrounds the center electrode is not necessarily an indication that the plug is too hot, although sometimes it is. The blistered appearance can be caused by the glaze with which the porcelain is covered in manufacture. A set of plugs that are too cool for a given operation usually result in hard starting, poor idling and fouling with a heavy oil carbon. Generally speaking a spark plug that shows a black center porcelain is too cool and one that has a white powdery center porcelain is too hot, and the plug that is right usually has a chocolate brown color on the porcelain that is exposed to the combustion chamber.

Spark plug maintenance is just as important as the selection of the correct plug. Spark plugs should be cleaned and inspected every 2500 to 5000 miles. Upon removal from the engine the plug should be closely inspected for any indication that it is too cool or too hot for the service that it is being called upon to perform. The plug should then be cleaned and it is possible to clean a plug only when it is sand blasted with compressed air and an abrasive which is supplied by spark plug manufacturers. After a thorough cleaning the point gap must be carefully set to the required specifications. Then and only then will a test of the spark plug's ability to fire mean anything. If the accumulated carbon is not thoroughly removed before testing you can save yourself the time of testing because you will not know anything about the plug when it is tested.

The most practical method of testing spark plugs is in a compression box but even this test is meaningless unless the gap has been carefully set. The ability of any spark plug to fire under pressure depends upon the gap. The amount of the gap being the measure of resistance that the spark must overcome.

Perhaps the most insidious of spark plug troubles is compression leakage through the plug. The plug will continue to fire but the heat characteristics of the plug change. A one-half cc. per minute leak will not seriously affect the operation of the plug, but 5 cc. per minute will definitely change the plug

one full step on the hot side. Leakage can be tested by obtaining a threaded coupling which will fit the plug opening in the tester and attaching this coupling to an air hose which has a fitting on the other end to accommodate the spark plug. Then with the air turned on and the spark plug immersed in a pail of soap suds any leakage will show up in unmistakable manner.

**LEAKAGE** can cause "pinging." So can a plug that is too hot for the engine. Other factors that can cause pinging are valves not seating properly, head gasket that projects into the com-

bustion chamber. In short it can be caused by anything that creates an excess of local or general engine heat. If the "ping" is caused by anyone of these reasons it will be accompanied by rough running, loss of power after some fast operation or spitting back into the carburetor. It is the result of pre-ignition which is the condition when some portion of the combustion chamber is hot enough to actually fire the charge before the plug sparks. In addition to the troubles just mentioned, pre-ignition causes fast bearing wear because of high pressures created and it  
(TURN TO NEXT PAGE, PLEASE)

Over-Loaded  
TRUCKS  
*Can be*  
**STOPPED**  
*with*



**MIDLAND** *Power Brakes*  
(Christensen)

**Check These  
MIDLAND FEATURES**

- ✓ *Never cost more* and generally *less* than other power brake equipment.
- ✓ Highly efficient because of their light weight, simple design and sturdy construction.
- ✓ Serviced by a nation-wide organization of Midland Distributors.
- ✓ Adapted to all types of vehicles.
- ✓ Patented control valves give "Brake Feel."

MIDLAND Power Brakes are inexpensive insurance against costly accidents caused by inadequate brakes on overloaded trucks. That is why they are standard with the largest manufacturers of trucks and trailers. That is why they are used and endorsed by the largest fleet operators.

Made by one of the world's largest parts manufacturers under exclusive Midland-Christensen patents, Midland Power brakes are interchangeable in fleet operation, conform to all state laws. If you want to carry bigger pay-loads and yet maintain schedules with safety, specify Midland Power Brakes on new equipment. Learn how you can give your present trucks Midland-Protection at low cost by consulting your nearest Midland distributor—or send the coupon below.

**WRITE ABOUT OUR DISTRIBUTOR  
FRANCHISE—YOUR TERRITORY MAY  
BE AVAILABLE.**

*Complete line of Power Brakes—both  
air and vacuum—including kits for  
Ford, Chevrolet, Dodge, GMC and  
International.*

**MIDLAND STEEL PRODUCTS CO.  
10605 MADISON AVE. : CLEVELAND, O.**

MIDLAND STEEL PRODUCTS CO.  
10605 Madison Ave., Cleveland, Ohio

Send complete facts and price on Midland Power Brakes for.....  
.....trucks

Name .....

Address .....City & State.....



frequently results in a blown head gasket. It is possible to have pre-ignition without the "pinging."

Pre-ignition should not be confused with detonation which has to do with the chemistry of fuel combustion. Rapid or uneven combustion of the charge will cause a "pinging" which has nothing to do with pre-ignition. Spark timing set well ahead will give the same result. Detonation is relatively harmless and has nothing to do with spark plugs.

Higher compression pressures, higher engine speeds and smaller spark plugs will make the care of spark plugs a more exacting job than ever before.

## We Buy Truck Beauty

(CONTINUED FROM PAGE 17)

elsewhere, we get a high quality spray job with a carefully trained helper holding the gun.

Up to the present we have been stripping trucks with regular paint remover. This job required nearly two days. Hereafter we plan to use the cold stripping method and hope to reduce the time for this job to a half day, thus further lowering the cost of a complete truck refinishing job.

Touch-up jobs done once a year be-

tween complete refinishing involve conventional touch-up and spotting followed by the application of black wax with an electric applicator which bur-nishes, too. This treatment gives us a beautiful, lasting job.

**A**N important part of the beauty aid in our operation concerns fender straightening. Our trucks average 100 to 150 stops a day. Each stop means proper parking, and, needless to say, truck fenders come in for a fair share of rough treatment. We have never been guilty of the inconsistency of operating well painted trucks with banged-up fenders.

It used to cost us \$1,500 a year to keep fenders and bodies in first class condition.

It now costs us one man's labor totaling not more than two weeks of the year to do our own body and fender straightening in our shop. At the very most the total cost for this work is \$100 yearly for the entire fleet of 36 trucks!

That's a saving of \$1,400 a year.

To turn the trick, we purchased electrically operated fender straightening equipment. The equipment paid for itself in the first couple of months.

Between our fender straightening equipment and painting practices, we now save approximately \$5,800 every two years or \$2,900 yearly. This figure represents the saving of approximately \$3,000 every two years over former painting costs and the saving of \$2,800 every two years over fender and body work formerly farmed out.

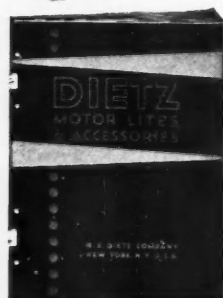
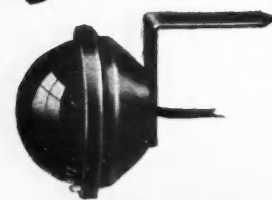
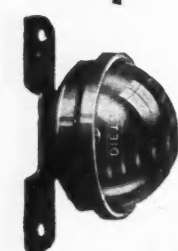
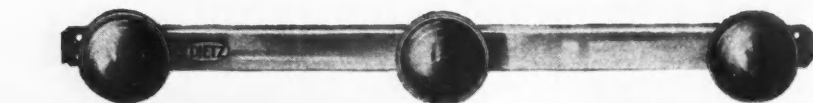
**W**E still find it desirable to farm out our major repair work, however. This major repair work includes anything up to but not cylinder reboring which we never do. Trucks are usually operated for their life of about 75,000 miles and then turned in for new equipment. During that time they will have had three valve and carbon jobs, and will have been operating for about five years.

Our own inspections are made every 1200 miles and include checking the entire truck.

We check tires carefully and our trucks are never seen with tires that look as though they might go flat any moment. New tire life averages 15,000 miles and in order to get this mileage (an accomplishment in our type of operation, we think) tires are changed from front to rear and rear to front every 5000 miles.

To date we have retreaded 36 tires and have had only four failures. Retreads have been found to be safe for city trucks. They are not used on suburban runs. Our retreads average about 10,000 miles and cost about one half of new tires.

## BUY "QUALITY" FOR "SAFETY"



**DIETZ**

### TRUCK and BUS LITES and SIGNALS

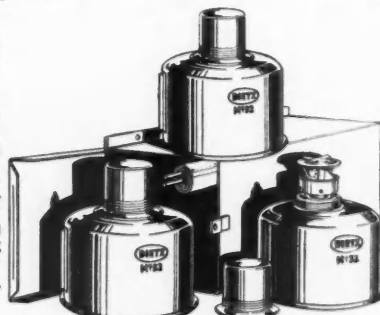
*Respectfully Yours For*  
**QUALITY, SAFETY, ECONOMY**

**D**IETZ Automotive Lites and Signals have the Quality which is twin brother to Safety.

They prove also that there is an equally close relationship between Quality and Economy.

Many "must" laws have been passed by State Legislatures regarding lighting and signalling equipment. But these laws have trailed the action of some truck and bus operators who believe in safe operation for its own sake and who adopt safety equipment as conditions of traffic make it necessary.

We have recently issued a handsome new Catalog which illustrates the newest types of modern Safety Lites and Signaling Devices for Trucks, Busses and Automobiles. It may interest you to have a copy on file. If so, just ask for it.

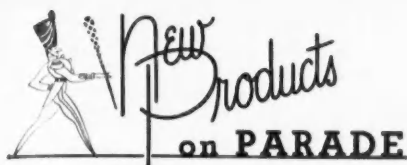


DIETZ NO. 332 FLARE KIT

**R. E. DIETZ COMPANY, NEW YORK**  
**PIONEER MAKERS OF VEHICLE LAMPS, FOUNDED 1840**

HEAD LIGHTS • TAIL LIGHTS • MARKER LIGHTS • DITCH, FOG & SPOT LIGHTS • DIRECTION SIGNALS  
TRUCK FLARES • REAR VISION MIRRORS • FLOOD LIGHTS • CATAPHOTE REFLECTORS • FIRE EXTINGUISHERS





(CONTINUED FROM PAGE 35)

## Oil Conditioner

THE Kralinator is a self-contained element, easily installed in any internal combustion engine, which automatically continuously separates the soluble from the insoluble portions of sludge built up in the motor. With the Kralinator attached, oil passes through the crankcase and the



conditioning element under normal engine pressure. Insoluble matter is trapped in the element and withheld from circulation. The useful portion of the oil returns to the crankcase.

The conditioning element has no moving parts and there is only the necessity of replacing the conditioning element from time to time. The manufacturer claims complete oil filtering and conditioning and high operating efficiency for the truck motor. Olixir Products Co., 895 Niagara Street, Buffalo, N. Y.

## Workshop Lathe

THE South Bend Lathe Works, South Bend, Ind., announces that its 1936 model



9-in. workshop lathe is now available with the new pedestal type of motor drive.

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SEPTEMBER, 1936

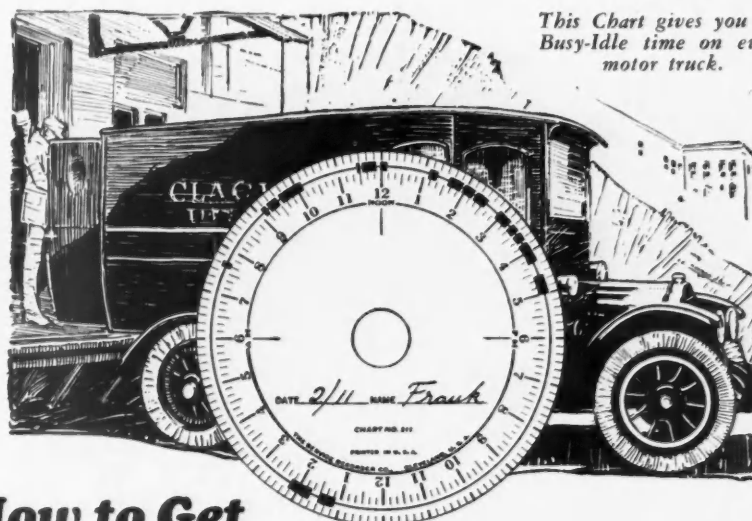
The pedestal motor drive mechanism is a separate unit mounted on a metal pedestal back of the lathe, with the horizontal countershaft and motor supported at the top of the pedestal in line with the headstock cone pulley.

An adjustable tension brace between the countershaft and the headstock regulates the tension of both the flat belt between the cone pulleys and the V-belt from motor to drive pulley. A belt tension release lever attached to the tension brace permits easy shifting of the cone pulley belt from one step of the pulley to another. When the lever is pulled toward the operator, the motor drive is tilted forward on its pivoting frame sufficiently to easily shift the spindle belt.

## Siloo Stops Freezing

THE Motor Fume Utilizer Corp., Long Island City, N. Y., has developed a crankcase anti-freeze which they have named Winter Siloo. The compound when added to the crankcase lubricant will prevent the freezing of the water which is in the crankcase as a result of condensation. In addition it will tend to prevent the production of harmful acids in the crankcase and it will prevent the formation of sludge. The addition of one quart of winter Siloo to 10 gal. of gasoline will prevent freezing in the gasoline lines, carburetor and fuel pump at any temperature.

(TURN TO NEXT PAGE, PLEASE)



## How to Get THAT "EXTRA TRIP PER DAY"

"We are now getting an extra trip per day!" report many *Servis Recorder* users. How is it done? Often merely by eliminating a 20 minute or 30 minute delay. Suppose this: "The truck gets home at 4 o'clock, and it doesn't quite pay to send it out on another trip." If the truck had got home at 3:30 then it would have paid to make the extra trip. Same thing at noon: "Here's the truck coming in at 11.15. Well, let's see, it's almost lunch time, so we'll wait till after lunch before we send it out."

### HOW TO CORRECT IT

This is a thing which happens again and again and generally it doesn't correct itself, until the *Servis Recorders* are installed and their charts show daily all wasted time—all delays. Suppose you operate six trucks, and you get an extra trip per day with *each* truck! It means you can probably cover your present territory with five trucks, thereby saving three or four thousand dollars a year!

Send today for booklet—"Ten Ways of Getting More Work Out of Motor Trucks."



THE SERVICE RECORDER COMPANY,  
1422 EUCLID AVENUE, CLEVELAND, OHIO



(CONTINUED FROM PAGE 55)

### Co-Lubes for Gas Engines

CO-LUBES is the name of a dry concentrate containing synthetic graphite and other lubricating elements for use as a co-lubricant in gasoline engines. Used in both gasoline and lubricating oil, Co-Lubes give more miles per gallon of gas and makes engine oil last two to three times longer, the manufacturer claims. Co-Lubes should be used one concentrated pill to a quart of oil or to each five gallons of gas. This graphoid lubrication is available in tins of 12 for 50 cents or 36 for \$1. Gracon Mfg. Co., 2119 Gravois Street, St. Louis, Mo.

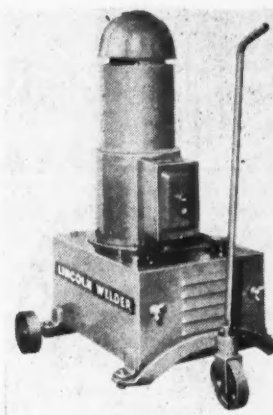
### Spray Gun Air Cap

THE DeVilbiss Co, Toledo, Ohio, has developed a new twin jet type suction feed air cap, No. 37, for use on their type CL paint-spray gun. The type CL is a small, light-weight gun recommended for medium requirements in product finishing, automobile and furniture refinishing, and other painting and finishing requirements.

The new cap is specially designed for use in the higher range of air pressures ranging from 45 to 75 lb.

### Lincoln Welder

A NEW motor-driven, single operator type arc welder for general fabrication and repair work has been developed by The Lin-



coln Electric Co., Cleveland, Ohio. This machine is designated as the "SA-150," with a rated current range of 45 to 200 amp.

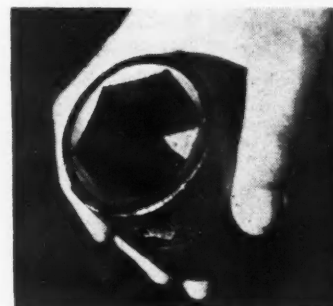
The welder has dual control of voltage and current, allowing independent adjustment of arc heat and arc penetration to suit the welding application. It is insulated with Class B insulation.

The "SA-150" is powered by a Line-Weld 7½ hp. A. C. motor and is available for 60 cycle power circuits of 220 or 440 volts, three or two phase. Either portable or stationary models can be supplied. Net weight of stationary model is 425 lb. The welder occupies a floor space of less than 2 ft. square.

### Bonney Socket

BONNEY Forge and Tool Works, Allentown, Pa., has recently added to its line of 1-in. square drive extra heavy-duty sockets, three new sizes known as Nos. X72, X94 and X100.

No. X72 has 2¼-in. hexagon opening



and is for 1½-in. Am. Std. bolts and nuts, while Nos. X94 and X100 have hexagon openings of 2 15/16 in. and 3 3/8 in. and are for U. S. S. bolt sizes 1 7/8 in. and 2 in. respectively.

### Weaver Headlight Chart

WEAVER MFG. CO., Springfield, Ill., has prepared a new chart showing the direct relationship which exists between safe night driving speeds, and the brilliance (or intensity) of well directed headlight illumination.

The chart is based on tests conducted by Weaver in cooperation with engineers from the Illinois State Highway Department, in which the Weaver electric eye headlight tester was used to measure the intensity of each headlight beam in candlepower, thus making it possible for any car owner to determine his maximum safe night speed from the chart. The chart is 35 cents.

COMMERCIAL CAR JOURNAL  
SEPTEMBER, 1936



### COULD OLYMPIC SPRINTERS BREAK RECORDS WITH HEAVY BOOTS?

Could America's fleet sprinters at the Olympic Games have run their races in faster time by wearing heavy cavalymen's boots instead of light track shoes? The answer is obvious—the extra weight would have so bogged them down that every other runner would have out-distanced them.

Dead weight on a truck is as much of a handicap. That's why so many fleet operators and manufacturers are turning to Haskellite Plymetl

for truck sidings. A square foot of Plymetl weighing only 3½ pounds is as stiff as a square foot of 14-gauge steel weighing 16 pounds.

The relative lightness of Plymetl is not its only virtue. No inside braces or supports are needed to give it rigidity and strength. Comes in shippable sizes big enough for an entire side. Scum, dirt and grease are washed off so easily that trucks always look like new.

Insist on Plymetl in your specifications



STEP-IN-DRIVE TRUCK  
BY "SHOP OF SEIBERT,"  
TOLEDO, OHIO — 1/4-IN.  
"VE" PLYMETL USED

HASKELITE OFFICES  
IN NEW YORK,  
DETROIT, CHICAGO

### HASKELITE MANUFACTURING CORPORATION

208 WEST WASHINGTON STREET, CHICAGO, ILLINOIS



# GAR WOOD COAL UNITS



*Prospect No. 1—"I am interested in a unit just about like the one illustrated—a Gar Wood type W9 aluminum body and Model F4CA hoist."*

*Prospect No. 2—"This combination C5 body with the D6 hoist appeals to me. It carries 2 tons of coal or 2 tons of coke when sideboards are used."*



A HOIST AND BODY  
for  
EVERY COAL HAULING JOB  
... and  
EVERY TYPE AND  
SIZE OF CHASSIS

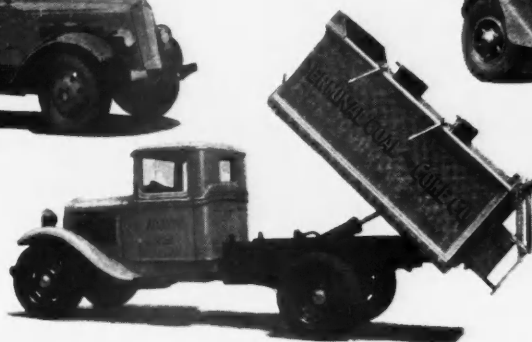


*Prospect No. 3—"I have a bulk hauling contract and would like figures on a similar low mount semi-trailer unit with Model T44 telescopic hoist."*

*Prospect No. 4—"We use 6-wheel trucks and will be in the market for one this fall, with a Gar Wood W10 body. It looks big and husky, with plenty of space for advertising."*



*Prospect No. 5—"Our competitors are using Hi-Lifts for loop deliveries. Bring us information on a complete outfit like this mechanical unit shown in the Gar Wood folder."*



*Prospect No. 8—"No one has ever shown us how we can haul bigger loads by using an aluminum body like this. Naturally we'd be interested."*

*Prospect No. 6—"This would be the right unit for me—a long wheelbase light duty truck and a Gar Wood C6 body and FICS hoist. Then I could handle half ton orders and show better profits."*

*Prospect No. 7—"I'm ready to listen to anyone who can improve my hauling efficiency and right now I'd like to know more about this unit with the Gar Wood T44 telescopic hoist."*



## GAR WOOD INDUSTRIES, INC.

DETROIT, MICHIGAN

WORLD'S LARGEST MANUFACTURER OF TRUCK EQUIPMENT



ciency and safety. But we decided, about a year ago, that it was too much to expect of our drivers to trust them with full responsibility for the inspection of their trailers. For example, a driver occasionally would allow his lanterns to go dry or get dirty, or let the rear-end safety markings get muddy. With regard to engine conditions and excessive tire wear from poor wheel alignment, many of our good drivers

Above—Truck running time report on which is kept complete time records of all truck equipment. Right—Charge ticket kept by the shop. Code numbers are explained in the article.

simply were not competent to make such inspections.

Perhaps our operating situation is rather fortunate, in that most of our drivers return their equipment to our central Chicago garage about every other night. So we now have a trained man who inspects each tractor and trailer every time it is returned to the central garage. The tractor and trailer is first thoroughly cleaned. Then comes a short inspection job. This includes lights, listening to the engine, checking wheel alignment and tire inflation.

**A**NOTHER kind of inspection of our trailers comes through our greasing program. Approximately every 5000 miles, we do a thorough trailer greasing job, when wheels are pulled and brake bands and drums are inspected. We believe this is well worth-while. For example, in a recent inspection a slight crack was found on the axle housing of a tractor. The truck was promptly pulled out of use long enough to replace the defective part, which may have saved a road break-down. We keep our mileage record on a blue sticker on the windshield of the truck after each greasing, showing at what mileage the equipment is due back in the shop, which is every 1000 to 1500 miles. We run these greasings in a series of five and show on the sticker a numeral 1 to

(TURN TO PAGE 64, PLEASE)

# ASSEMBLING 1 $\frac{1}{3}$ BODIES of MET-L-WOOD

- Have your new bodies crowned with MET-L-WOOD too.
- Years of service have eliminated experiment from this construction.
- You are guaranteed:
- No leaks.
- Insulation in roof.
- Attractive appearance.
- Lighter construction.
- An all-steel outer shell.
- Freedom from rips or tears.
- No maintenance from ordinary use.

**A licensed builder in your territory will construct a "1-1/3 body" tailored to your specifications. Met-L-Wood provides this extra third in the form of more space—no ribbing or thick walls. Lighter weight—Met-L-Wood laminations of wood and steel—makes obsolete heavier and weaker construction.**

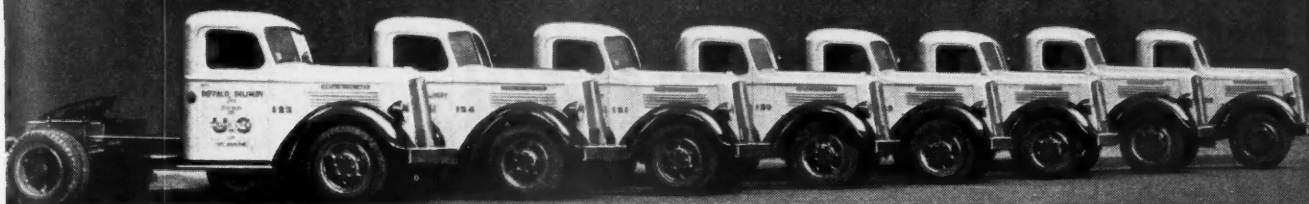
**Met-L-Wood bodies are complete.  
This stronger and lighter construction  
covers bottom, top, and sidewalls.**

**Write today for information on crown-  
ing your bodies with a roof of Met-L-  
Wood.**

**MET-L-WOOD CORPORATION**  
6755 WEST 65th Street Chicago, Ill.



**FLEET OWNERS**  
are proving  
**IT'S A GREAT VALUE!**



In your industry, in other industries—in communities throughout the country—profit-minded business men are putting GMC trucks to work. And then they are quickly confirming their good judgment by proving conclusively the downright value of a GMC.

Whatever the hauling demands of your business may be, there's a GMC to fit—and fit exactly. Take for instance the GMC 3-ton truck that is priced at only \$895, chassis f.o.b. Pontiac. It has a larger engine than ever before in a GMC at this low price. It has an efficient valve-

in-head engine and many, many modern mechanical refinements that assure utmost economy, performance and reliability. There is, likewise, advanced streamlined styling which sets it apart as a truly distinctive vehicle. And available for this 3-ton GMC is the all-steel "helmet top" cab—a rugged, roomy, comfortable and weatherproof driver's compartment if there ever was one.

Get the facts through seeing and comparing this great 3-ton value. Or if your needs call for a smaller or larger truck, there is a quality General Motors Truck with value equally as great.



**General Motors Trucks and Trailers**

GENERAL MOTORS TRUCK COMPANY. PONTIAC, MICHIGAN



RECORD OF TIRE CHANGE			
Date _____	Trailer No. _____	Tractor No. _____	
Position on Tractor or Trailer	Old Brand No.	New Brand No.	Speedometer Reading
Reason for Change:			
Old Tire to be: Repaired <input type="checkbox"/>	Discarded <input type="checkbox"/>	Get Adjust. <input type="checkbox"/>	Driver's Signature _____
Replace on Equipment <input type="checkbox"/>	Use as Spare <input type="checkbox"/>	To Other Equip. <input type="checkbox"/>	

Date Out	Drivers Name	Emp. No.	Time Started on Trip	Time Tr.
Orig. City Driver				
Orig. Highway Driver				
Dest. Highway Driver				
Stops Enroute - Where	Reason For Stop	Time Stop	Time Lv. Again	Time Lost
From _____	To _____	Time Out	Time In	Time Enroute
Remarks:		TRUCK NO. _____		Lv. Blank
Inspected By _____				

Above forms are of the front and reverse sides of the tire record forms kept by the Decatur Cartage Co.

5 designating what particular greasing of the series is the present one. When

the fifth greasing occurs we give the equipment a very thorough inspection,

especially with regard to brakes, wheel bearings, shackles, and wheel alignment.

FOR our office records, a tractor and a semi-trailer is recorded as an equipment unit, though we are considering the advisability of having an individual record card for each trailer. We use the following records forms:

1. Driver Trip Report. This is turned in by each driver, showing his time in and out of the terminal, stops en route, and reasons for the time lost.

2. Truck Running Time Report. This summarizes driver trip reports and shop services. As possible "delays" the driver may check: Mechanical; Tire Trouble; Freight en route; Police Loading; Other. The shop inspector may check: Lights out; Tailgate dirty; Equipment dirty; Tires inadequate; Tires underinflated; Brakes poor; Needs mechanical attention; No grease or oil change; Safety equipment.

3. Charge Ticket. Items listed as chargeable to a unit of equipment are Oil, Greasing, Washing, Storage, Painting, Inspection, Equipment, Repair Parts, Tires.

4. Record of Tire Change. One side is filled and signed by the driver, and the other side by the garage inspector.

5. Vehicle Tire Record. This is a summary sheet for the six tires of a tractor-trailer unit.

6. Office summary sheet for all tractor-trailer units.

7. Summary file card for each tractor-trailer unit.

AT one time the company had only open-top trailer bodies, with protective tarpaulin coverings. But many cargo damage claims from weather and pilfering caused the company to change exclusively to closed tops except for a few units hauling some kinds of machinery.

Another change has been to remove all tailgates from trailers. With a tailgate handy there was a constant temptation to load it with freight. Also, one time a paint barrel on a tailgate got loose and rolled to the pavement and (TURN TO PAGE 70, PLEASE)

COMMERCIAL CAR JOURNAL  
SEPTEMBER, 1936



## SAF-T-LOK MAKES EVERY MEMBER OF FAMILY SANE DRIVER

### New Device Enables Owner to Set Maximum Auto Speed With Dash Lock

Many of the millions of injuries and deaths expected next year, as the result of excessive and reckless speed, will be averted through the use of SAF-T-LOK, a new product, designed especially for passenger cars. Made by the oldest and leading manufacturer of speed control devices—SAF-T-LOK is the ideal protection against speed slaughter.

By means of a lock mounted on the instrument panel, the top speed of the car can be set at any predetermined rate, with no loss of power or acceleration. In locked position, SAF-T-LOK eliminates worry by keeping wives and children in the safe speed range where brakes can prevent accidents. Where high speed is safe, the holder of the key can attain the full speed of the car by simply unlocking the device. SAF-T-LOK is available for all types and models of passenger cars. Write for literature.



**MONARCH GOVERNOR COMPANY**  
1832 BETHUNE AVE., W. • Distributors in all Principal Cities • DETROIT, MICH.



# YOU SALES MANAGERS WANT TO

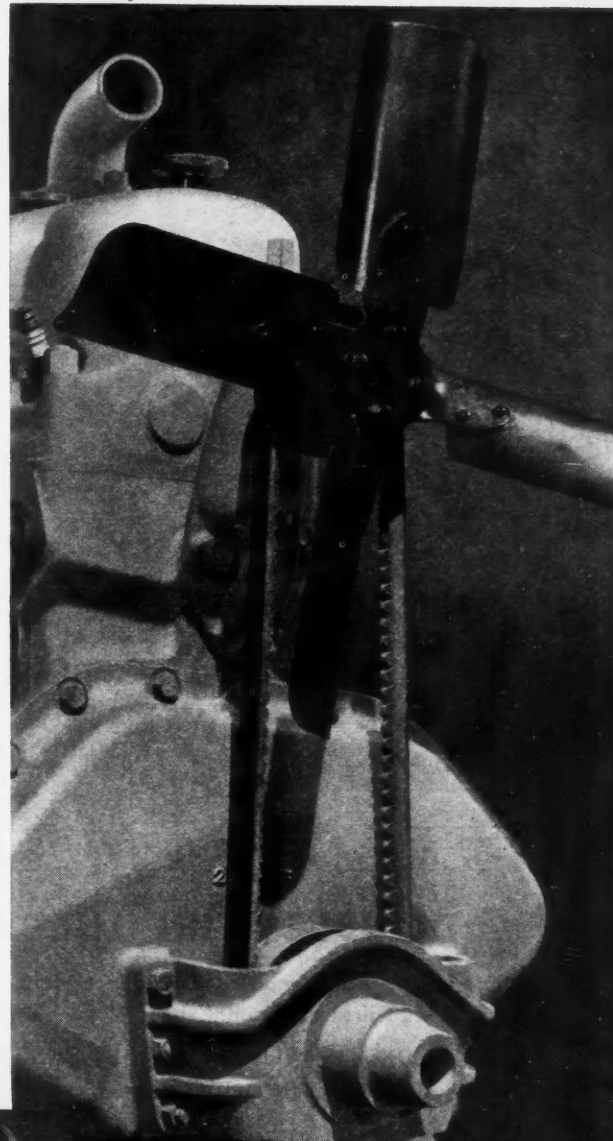


# KNOW

"My men can sell, but they must have something worth while. Give me a 'different' product and we can sell at a profit. What can we do that will actually make our product different?"

## THE ANSWER

Revitalize your product, and it will revitalize your sales. When competition brings your product to a level of deadly similarity to all others of its kind, it crushes enthusiasm, and kills ambition. Most engines are alike—have no real distinction in performance, appearance and sales appeal. Waukesha Hy-Powr Engines are different—20% to 30% more power, with an equal saving in weight and size—with a difference in performance that will convince your prospects that a new standard has been set. Write for Bulletin 885. **Waukesha Motor Company, Waukesha, Wis.**



# WAUKESHA

## ENGINES



## Trailer Management Methods

(CONTINUED FROM PAGE 64)

caused a passenger car that was following close to turn over in a ditch, with resulting heavy damage payments. Tailgate loads also destroyed the value of the black and white safety warnings which our company has been one of the first to use. These rear-end safety markings have helped us to cut our rear-end collisions from a former average of about two a month to only a single one during the first half of 1936.

The elimination of tailgates has made loading easier, and makes possible better protection from storms when loading from a warehouse platform.

**W**E have found that trailer side doors are often a real loading convenience. The company plans soon to establish its own shop for the trailer paint-up job so desirable in order to get the most advertising value from our trailer body signs.

Another maintenance problem with trailers is to keep the landing-gear of trailers in smooth operating condition.

Our trailer inspection includes the

periodic cleaning of all tractor "fifth wheels," and checking them for material flaws and excessive play. Close attention is given to trailer wiring for lighting, and we find it a good investment to specify heavy wiring, and substantial male and female coupling units for quick hook-up lighting connections. For added road protection at night, the company has fitted all trailer bodies with green lights at each of the four front corners; to accurately outline the size of the trailer. As another safety precaution, all trailer tractors are provided with right and left mirrors.

**A**NOTHER recent change in company management methods with trailers has come through the demonstration that, on some of our shorter runs, one tractor can serve two trailers and thus cut in half the labor costs for terminal loading. This has proved more practicable for runs of 100 to 135 miles, requiring three to five hours one way. As an example, it was our former practice to send a tractor-trailer unit from Chicago to Danville as well as from Danville to Chicago each night, the driver remaining at the destination point until morning so he could make deliveries. This broke up the driver's hours in a very unsatisfactory way and only gave us about four hours' road time on each tractor every 24 hours.

Now, by starting the unit out of Danville around seven each evening, it reaches Chicago about eleven and spots the trailer at our platform. The driver then couples on to the full trailer which has already been loaded and filled with Danville freight and after a short rest is back in Danville with the freight by four or five in the morning, thus assuring early deliveries at both locations, saving one driver's time and the use of one tractor.

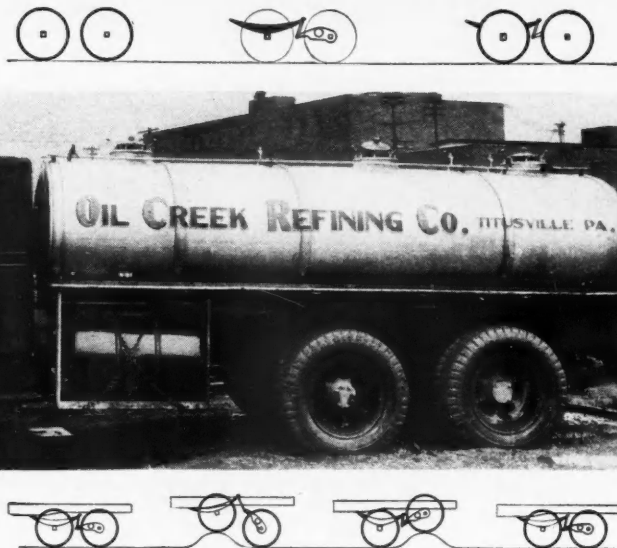
When we transport cargoes of exceptional value, it is the company practice to send three or more trucks in a convoy group, as a precaution against hijacking. Also, a number of our company trucks have been equipped with an automatic alarm system to give warning to the driver when there is any tampering with the rear end.

**T**HE company plans to experiment with the use of larger 26-ft. trailers, drawn by "snubnosed" tractors. The extra 4 ft. in length, and the increase in height from 6½ ft. to 7 ft. increases the load capacity of the trailer body by about one-third.

The increase in length for these tractors, reduction of weight through the use of lighter, stronger alloys and more streamlining is the writer's prediction for semi-trailer changes within the next few years.

# TRUXMORE

## WORLD'S BEST 3<sup>RD</sup> AXLE



## DOUBLES TIRE MILEAGE

Truxmore is installed on your truck very accurately. It can't get out of line and scuff tires on straight roads or even on curves.

Truxmore's soft, smooth ride (produced by Gravity Spring Suspension) reduces road impacts and lengthens tire life.

Cuts your tire bill on each truck several hundred dollars per year (of 50,000 miles).

*Truxmore-truck in photo ran tires 100,000 miles.*

New York  
Syracuse, N. Y.  
Binghamton, N. Y.  
Rochester, N. Y.  
Erie, Pa.



Chicago, Ill.  
Philadelphia, Pa.  
Pittsburgh, Pa.  
Boston, Mass.





Increased Load Capacity for  
a given drum size.

Tripled Lining Life  
(guaranteed).

Permanently Equalized—(no  
adjusting).

Direct Air or Low Pressure  
Hydraulic Operation.

For complete information on  
Design, Construction, Installa-  
tion and Service write for  
Catalog 102-1a.

Linderman Devices, Inc.,  
149 Broadway, New York, N.Y.

Factories at Newburgh, N.Y.,  
and Woodstock, Ontario.

COMMERCIAL CAR JOURNAL  
SEPTEMBER, 1936

... AND THE SAME PRESSURE  
UNDER EVERY SQUARE INCH

**LINDERMAN**  
**BRAKES** *for Vehicle*  
**CONTROL**



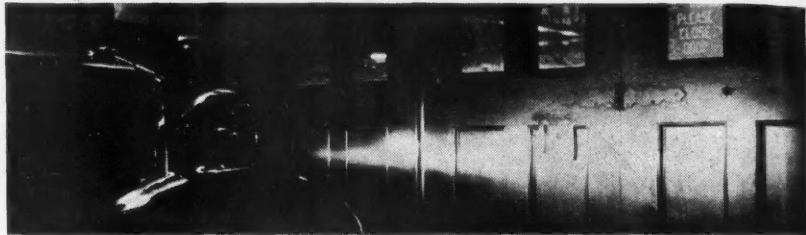
## Shop Hints

(CONTINUED FROM PAGE 33)

### Electric Eye Opens Garage Doors

From New York Power & Light Corp., Albany, N. Y.

AT the Albany garage of the New York Power and Light Corp., a system of automatically opening heavy garage doors is of great value at night when there are fewer employees on duty. The beam of an electric light shining from an automobile headlight is sufficient to



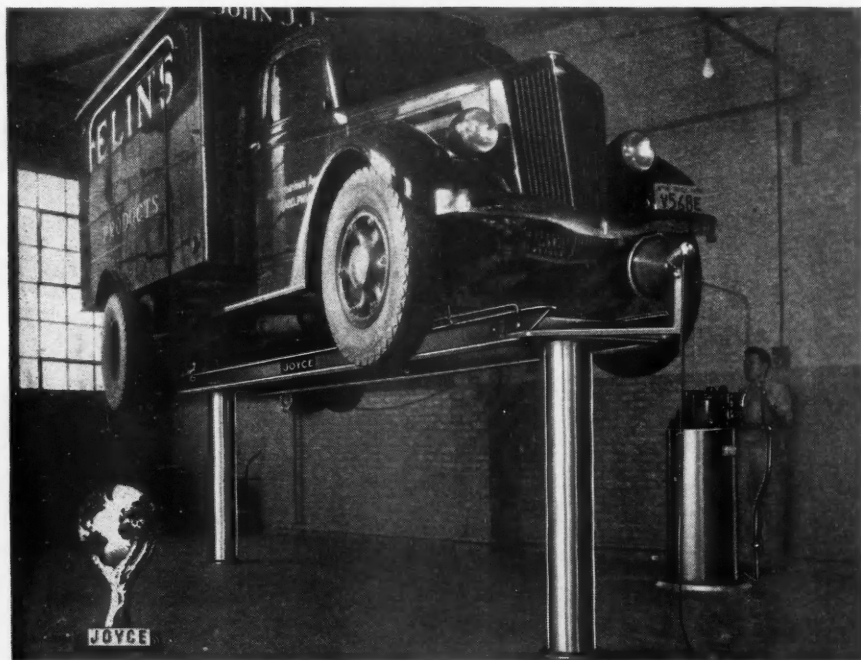
Electric eye for opening garage doors actuated by headlight beam

start the machinery for opening the garage doors.

A hole drilled in the door carries a metal tube which contains a photo-

electric cell and from this tube wires lead to the amplifying device attached to the garage wall. A piece of heavy glass is placed over the hole in the garage door to protect the delicate tube.

When the beam of light from the vehicle headlight strikes the photo-electric cell a minute current is sent to the amplifying device where a vacuum tube increases the current sufficiently so as to operate a relay for controlling a regular electric door opening mechanism. During daylight hours the door is opened by regular electric push buttons.

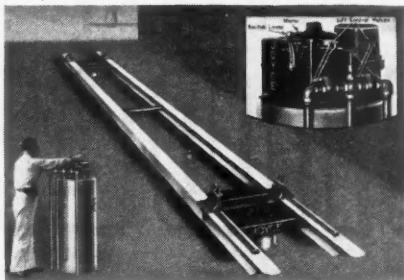


## You must keep 'em rolling!

With thousands of customers depending on transportation companies to haul their merchandise millions of miles each year the fleet owners of the country must keep their wheels in industry constantly turning. This matter of maintenance is a tremendous job. It calls for the finest of trained mechanics and the most efficient service equipment.

Lifting equipment is indispensable. In this branch of the automotive field—after years of actual use—JOYCE TRUCK LIFTS have demonstrated their ability to contribute to low maintenance costs for Rapid Transit Companies, Contract Haulers, Chain Store Fleet Owners and State Highway Departments.

There are Air or Electrically operated Joyce Lifts to handle all capacities between 8,000 lbs. and 40,000 lbs. Whatever your lifting problems Joyce is certain to be of invaluable assistance. Write your jobber or the factory for information today. The Joyce-Cridland Company, Dayton, Ohio.



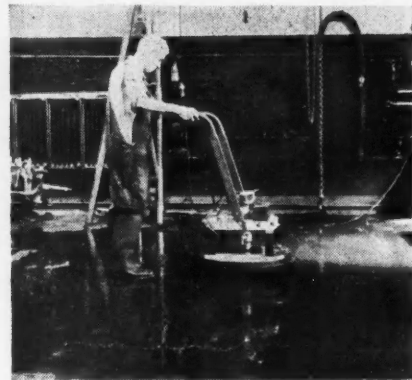
# JOYCE LIFTS

BUILDERS OF LIFTING DEVICES SINCE 1873

### Electric Floor Scrubber

From An Eastern Oil Refinery Shop

ANYONE who has tried to clean shop floors by hand knows the value of an electric floor scrubbing machine but



relatively few shops have them because of the investment. Here is one that was made in the shop and the power is supplied by an electric drill which can be removed quickly and easily so that the drill can be returned to its original business of drilling holes.

The scrubber consists of a 1/2-in. breast drill supported by a shop made wooden frame which is mounted on the head of an old oil barrel. The drill turns a round scrubbing brush 10 in. in diameter at ordinary drilling speed. The brush is one that can be supplied by any brush manufacturer. It is fitted with a driving pivot which is inserted in the drill chuck. The whole machine moves about on three casters and it is guided by two old plow handles.

COMMERCIAL CAR JOURNAL  
SEPTEMBER, 1936



# Sterling DIESEL MOTOR TRUCKS

## ENDURANCE

Over half a million miles have been traveled by a number of Sterling Diesel trucks. Endurance-ability to "stand the gaff" is a built-in quality of every Sterling motor truck.

There is a Sterling to meet your specific requirements.

Write today.

**STERLING MOTORS CORPORATION**  
MILWAUKEE, WISCONSIN

For running-in new and rebuilt engines use auxiliary lubricants containing "dag" Brand colloidal graphite.

**Acheson Colloids Corporation**


Port Huron  Michigan

\*REG. U. S. PAT. OFF.

# St. Paul HYDRAULIC HOISTS & BODIES

There's a St. Paul Hoist to fit every need. Distributors conveniently located in leading distributing centers . . . stocked and ready to make prompt shipments.

**St. Paul Hydraulic Hoist Co.**  
2207 University Ave., Minneapolis, Minn.



**TRADE MARK**  
**NOC-OUT**  
**HOSE CLAMPS**  
THE HOSE CLAMP WITH THE THUMB SCREW

Standard equipment of the automotive industry. Adjustable - one size equals many. Quick tightening, perfect seal. At all Jobbers.

Pat. No. 1,382,813.

**WITTEK MFG. CO.**  
4305 W. 24th Pl., Chicago, U.S.A.

THUMB SCREW ADJUSTMENT  
BALANCED (SIDE) PULL  
OVER LAPPING SEAL  
ONE SIZE FOR MANY  
ADJUSTABLE FOR SIZE

## Winter Maintenance Survey

(CONTINUED FROM PAGE 12)

### ON TIRES

121 operators used tire chains.  
24 operators did not use tire chains.  
6 operators were non-committal.

Cross links gave the following average mileages on the following types of trucks:

1,009 miles on light delivery trucks.  
510 miles on heavy duty trucks.  
532 miles on tractors.  
1,833 miles on trailers.

### ON DUAL WHEELS:

62 operators put chains on both tires.  
50 operators did not put chains on both tires.  
39 operators were non-committal.

103 operators use replacement links.  
17 operators do not use replacement links.

31 operators were non-committal.  
Fleet operators made an average annual investment in tire chains of \$224.06.

The average fleet replying consisted of 26.31 vehicles (22.41 trucks and 3.9 passenger cars).

## A Blizzard of Facts on Winter Maintenance

(CONTINUED FROM PAGE 13)

not evaporate." "Most dependable for hard driving." "(Non-volatile) does not evaporate and can be used from year to year." "(Non-volatile) is best in cars and new trucks." "Boiling point." "Eliminates hazard of boiling off alcohol. Glycerine not satisfactory." "Only kind we have ever used. Has been completely satisfactory." "Does not boil out. Safe." "Higher boiling point. No disagreeable odor." "Hard service, long runs—(non-volatile). Light service, short runs—alcohol." "(Non-volatile) for changing weather conditions. Alcohol for slow routes." "We do not have to worry about evaporation. Fewer cracked blocks." "Economy; save solution from year to year. Trucks are in intermittent service." "Low boiling point, strength, no odor." "Lack of odor and price." "Goes farther than alcohol so makes the cost smaller." "(Non-volatile) for a tight radiator or a late model truck." "Does not boil like alcohol. Does not damage radiator or connections."

And that small minority who use no anti-freeze speak thus: "No hardship on cold motors. No pilferage or other loss of anti-freeze." "Our preference to water is motor can be run warmer giving maximum heat for payload and cab." "We use no anti-freeze as it per-

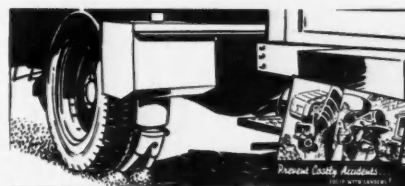


why gamble with  
**SKIDS?**

What chance has your driver when the streets are wet and icy?

In the fall and winter months temperatures often drop suddenly. Ice forms before you know it and even the best driver cannot control his truck.

That's why hundreds of operators are insuring against skids by equipping with Lintern Sanders. The cost is small—the savings great.



Ask for folder "Seven Savings with Lintern Sanders" and discover how easy it is to insure against skids.

**Lintern  
SANDERS**

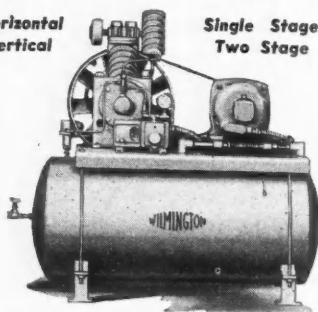
THE LINTERN CORPORATION  
7960 Lorain Ave. Cleveland, Ohio



## WILMINGTON COMPRESSORS

Horizontal  
Vertical

Single Stage  
Two Stage



### Always Ready When You Want It!

Reliability is the fleet operator's chief requirement of a compressor and Wilmingtons are dependable every day for years and years. When your trucks come in at night, you want the washing and greasing done at once; the tires checked; the dust blown off. With a Wilmington you get the work done without fail, thoroughly, at low cost. Learn about the "extras" that are standard equipment on Wilmingtons: non-pulsating check valve; protected motor; simple valves; positive un-loader. Ask for catalog.

The Auto Compressor Co.  
S. Mulberry St., Wilmington, Ohio



### A New Safety Device for TRUCKS and TRAILERS

The Robinson

#### AUTOMATIC BRAKE LOCK

Holds break-a-ways . . . provides Sure and Safe parking . . . meets all legal requirements . . . easy to install . . . automatic and unfailing. Write for illustrated details and prices.

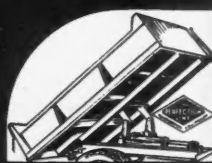
AMERICAN DIE & TOOL CO.  
READING, PENNA.

## STANDARD OR SPECIAL PURPOSE DUMP BODIES

OVERSIZE  
HYDRAULIC  
HOISTS

WRITE FOR BULLETIN  
AND PRICES

THE PERFECTION  
STEEL BODY CO.  
GALION, OHIO



## AUTOMOTIVE Clutches & Radiators

Heat Exchange Units for Air  
Conditioning & Refrigeration

LONG MANUFACTURING DIVISION

Borg-Warner Corporation

DETROIT  
WINDSOR

MICHIGAN  
CANADA

mits more heat from hot water heaters. Operated last winter in temperatures as low as —50. Tractors on 600-mile route. Run motors constantly unless in garage."

### Windshield Defrosters

There were 107 of the operators who used windshield defrosters, while 42 operators did not use windshield defrosters, and 2 operators were non-committal. As might be expected, there were a considerable variety of types used. Electric windshield defrosters were the most popular, with 66 operators so equipping. Forty-four operators used fans, 20 used heater tubes, 3 used impregnated defrosters, and 17 used defrosters of other types, and other methods, such as frost shields, vacuum tubes, double glass, chemicals, etc. As can be seen from these totals, a number of the fleet operators replying used two or more different types of defrosters.

In answer to the question, "What fault did you find with defrosters?", the following comments are representative (69 of the fleet operators failed to answer this question, either through indifference or satisfaction with their defrosters, if their vehicles were so equipped). These viewpoints are given below for what they are worth. In the absence of details concerning surrounding circumstances, they cannot be considered conclusive.

**Electric.** "No turn-off switch. Ran several batteries down." "Electric cracked windshields." "Electric type draw down batteries. Don't allow any type to be used from battery." "Fell off in severe cold weather." "Cracked windshields with electric coil type last year." "O.K. except in extreme cold." "Not good in very cold weather." "Did not do the job and would not stand up." "Lack of clear vision looking through 2 plates." "Not strong enough on modern cars." "The suction cups did not hold to windshield."

**Fans.** "Not reliable." "Fans are good with heater cab, otherwise electric." "Electric fans are noisy." "Fans not satisfactory—steam of working men's bodies after loading cream frosted door and windshield glasses." "Fans most dependable."

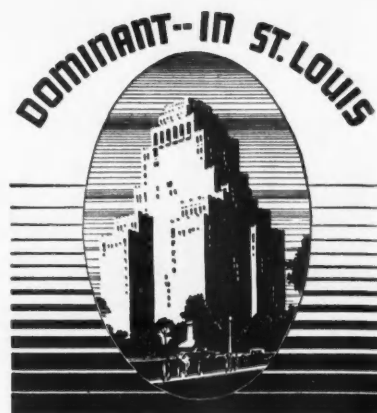
**Heater tubes.** "Electric inefficient in extreme cold. Heater tube O.K." "Fans not fast enough. Heater tubes decidedly best though a nuisance." "Best winter improvement we ever adopted."

**Impregnated.** "Open cabs—would not heat windshield."

But 35 of the operators found no fault with defrosters, although one operator replied that they were "not necessary."

### Driver Comfort

To insure driver comfort, cab heaters



## The Park Plaza

H. B. CALDWELL, Manager

Single from \$3.50 Double from \$5

### DEARBORN LINE

CAB-OVER-ENGINE FOR FORD  
TRUCKS

#### MORE ROOM FOR PAYLOAD

Dearborn Line Cab-Over-Engine Conversions give you a whole lot of room for payload and more profits! Moving the cab over the engine increases the payload space of your Ford Truck by 30% to 50%. You have the payload space of a large van and retain the fuel economy and maneuverability of a small truck! See your nearest Ford Dealer or write us direct.

TRANSPORTATION ENGINEERS, Inc.  
P. O. BOX 116 HIGHLAND PARK  
DETROIT, MICHIGAN

## ALGOMA

offers the two finest plywoods for truck body construction and upkeep.

**ALGOMALOID**—the finest of plywoods; glue bond; in panels of any desired length, widths up to twelve feet.

**ALGOMETL**—metal-faced plywood for side, end panels and doors; stronger than steel of equal weight, lighter than any other material of equal strength.

Send for the Algoma "Bag of Samples"

— TECHNICAL DIVISION —  
ALGOMA PLYWOOD & VENEER COMPANY  
BUILDERS BUILDING—228 NORTH LA SALLE STREET—CHICAGO, ILL.  
FACTORY, ALGOMA, WISCONSIN

Ahlberg Ground Bearings

40%  
Saving Over New Bearing  
Costs

AHLBERG BEARING CO.  
Chicago

Branches and Distributors  
Everywhere

Ahlberg Ground Bearings

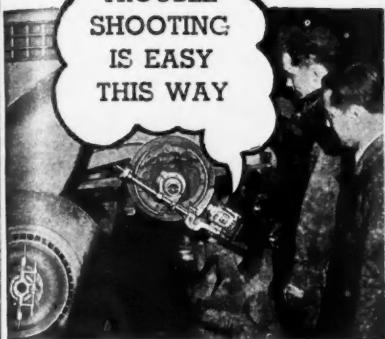
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SEPTEMBER, 1936



## STILES-BARRETT BRAKE- DOKTER

eliminates guesswork

TROUBLE  
SHOOTING  
IS EASY  
THIS WAY



... Turn Out Perfect  
Brake Relining Jobs  
In Half The Usual Time

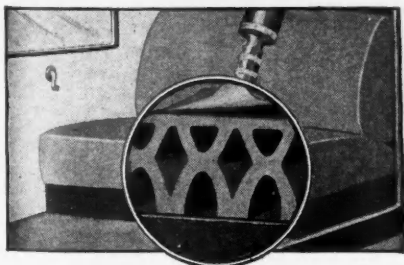
Ideal For Fleet Service

THE Brake Dokter belongs in the shop of every fleet operator. It centralizes, grinds and adjusts relined shoes to exact drum size, and in perfect alignment with the drum ON THE TRUCK or car—all in one operation. No dummy drums or adjusting tools are needed. Enables mechanic to do a perfect relining job. . . . Dealer price \$120.00 complete with all adapters for all standard passenger car and truck work. . . . Ask your jobber, or write us for details.

**STILES-BARRETT CORP.**

2741 Washington Blvd. St. Louis, Mo.

## Truck Owners Are Placing Their Faith And dollars In BLACK DIAMOND ALL-RUBBER SEAT CUSHIONS



Two of the big things fleet owners like best about Black Diamond all-rubber seat cushions and back rests, are their downright durability and economy. They know they can trust the patented diamond grid construction—because it will never "let them down."

They also know that today's Black Diamond seat cushion gives them more value for every dollar they invest. This special processed semi-sponge rubber cushion has a succession of features that can't be duplicated. Check these statements for yourself. Ask those who have equipped with Black Diamond cushions. Made to fit any size or shaped truck cab. For further details, write

**KARPEX MANUFACTURING CO.**

★ 1424 E. 19th St., Indianapolis, Ind. ★

COMMERCIAL CAR JOURNAL  
SEPTEMBER, 1936

were used by 104 of the replying fleet operators. Forty-five operators did not use cab heaters, and 2 operators did not answer the question. Several operators used two or more different types of cab heaters. Ninety-one operators used hot water heaters, 20 used exhaust heaters, one used a steam heater, and still another used a kerosene heater.

The types of service in which heated cabs were employed were described by 92 of the 104 fleet operators using cab heaters. Thirty-five used heated cabs in all types of service; 31 used cab heaters on long hauls; 17 had heated cabs for short hauls and local and city service; 4 thus provided for driver comfort in snow removal work; 2 had them for farm work; and one used a heater in open cabs.

Varying degrees of solicitude for driver comfort were shown in the answers to the question, "How else did you provide driver comfort for safety's sake?" Insulation of the cab, through weather-stripping, lining, and pads, here leads the list, with 15 out of the 54 commenting operators mentioning this as a means of driver comfort and safety. Two other operators mentioned warm clothes. Other answers included: "Sleeper cab and radio"; "Good cushions, good floor mats"; "It is entirely possible to be safe though not comfortable"; "Flashlights"; "Install heaters this fall."

### Winter Lubrication

The next two question are best answered in tabulated form.

During the very cold weather what viscosity oil did you use?

14 replied 10	1	"	30CT
4 " 10W	3	"	30-40
12 " 10-20	10	"	40
3 " 10-20W	1	"	20-40
48 " 20	1	"	20-40W
8 " 20W	1	"	35
5 " 20-30	1	"	10-50
2 " 10-30	1	"	10-20-50
1 " 10-30W	1	"	10-40
22 " 30	1	"	winter
1 " 30W	10		failed to answer

What viscosity transmission and rear axle lubricant was used?

1 replied 20	1	"	160
1 " 70	5	"	160
2 " 80	1	"	160EP
25 " 90	4	"	600W
1 " 90	1	"	250
4 " 90EP	20	"	winter
1 " 100	1	"	60W
4 " 90-110	5	"	summer
3 " 110	2	"	summer
1 " 110EP	68		failed to answer

Among these operators, one used 15 per cent kerosene in lubricating oil, one used 25 per cent, two used 10 per cent,

## DON'T DRIVE BLINDFOLDED

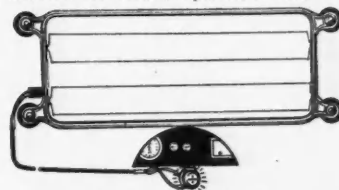


Sleet storms come at a moment's notice. Ice-coated windshields, poor vision, delayed trips, danger lurking in the foreground.

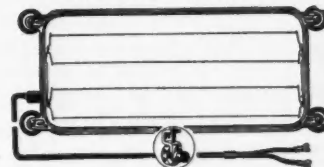
### HELP TO PREVENT WINTER ACCIDENTS

Be sure all the cars, trucks or buses of your fleets are equipped with CASCO Defrosters before they start out for the day—or the trip. Have them keep their Defrosters always ready for instant use, to relieve them of cloudy vision and doubtful, hazardous driving through snow, sleet or freezing rain storms.

Anticipate sleet storms—have your stock of CASCO Defrosters complete. Ask your wholesaler for contract prices, NOW.



No. 51 DeLuxe Chrome with illuminated Switch 18"x7"—\$6.00 List



No. 196 Defroster—Chrome with illuminated Switch 16"x7". List \$5.00



No. 41 Defroster Chrome, 16"x6" List \$3.50



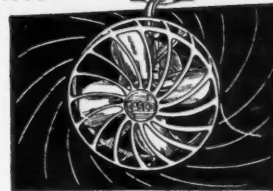
No. 26 Defroster—Chrome—13"x5 1/2" List \$2.25

### SPECIAL FEATURES

CASCO Positive Grip Suction Cups hold securely. Glass set in live rubber channel. CASCO Defrosters Remove Ice and Sleet under ALL conditions, using very little current. They Prevent Frost on inside of windshield without current.

**CASCO**

AUTO FANS



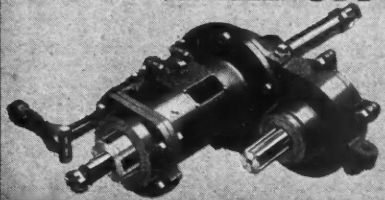
Keep frost off windshield in winter—circulate cool breeze in summer. Attach to steering post or on header board. Has an efficient, dependable motor, sturdy fan and attractively designed guard.

No. 35 DeLuxe Model \$3.75 list  
No. 36 Standard Model \$3.50 list  
Also Illuminated Switches for Defrosters and Hot Water Heaters, Fender Guides, Cigar Lighters.

ORDER FROM YOUR JOBBER  
CASCO PRODUCTS CORP.  
Bridgeport, Conn.



## HERCULES SPLIT SHAFT POWER TAKE-OFF



for **ANY TRUCK . . .  
ANY PORTABLE  
EQUIPMENT**

Hercules Split-Shaft Power Take-Offs are not transmission take-offs. They are installed in the drive shaft to transmit all of the power of the truck motor direct to any portable equipment. Various models available to operate as direct drive or from the side.

Consult Hercules Engineers with your Power Take-Off requirements.

**HERCULES STEEL PRODUCTS CO.  
GALION, OHIO, U. S. A.**

ALSO MANUFACTURERS OF DUMP BODIES AND HOISTS

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World's Largest Manufacturer of

**GOVERNORS  
AIR CLEANERS  
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OIL CONDITIONERS**

**HANDY GOVERNOR CORPN.  
DETROIT**

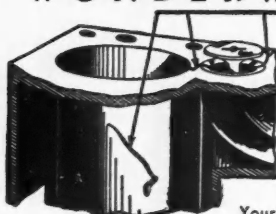
### Pin Hole Honing is Cheaper and Better than Reaming

● Never a dull tool or blade-marked hole; small investment; nothing to sharpen; no guess-work or inaccurate fits. Low cost replacement Abrasives; Micrometer Adjustment. Makes ANY mechanic an expert pin fitter. Ask your Jobber today for Standard or Heavy Duty Pin Hone Set you need.

3-TOOL  
SET  
\$24.00

**HALL  
PISTON PIN HONE**

### BREAKDOWNS CURED IN 30 MINUTES WONDERWELD



Valve port cracks, inside cylinder cracks are sealed in 30 minutes—not 30 hours.

Your Jobber Has It.

**MILLER MFG. CO.  
1218 KAIGHN AVE., CAMDEN, N. J.**

one used 18 per cent, one used 5 per cent, one used 33 per cent.

### Tire Chains

As is not surprising, 121 fleet operators used tire chains, while 24 operators did not, and 6 operators were non-committal on the subject. It is interesting to note that, among those who replied, the average mileage on light delivery trucks of cross links was 1009.057; on heavy duty trucks, 510.321; on tractors, 532.727. Only figures not suitable for an average were obtained as to trailers.

On dual wheels, 62 operators put chains on both tires, 50 operators put chains on only one tire, and 39 operators did not disclose their practices.

Some of the fleet operators explained their use of chains on dual tires and how they varied the practice. For example, 5 of the operators used chains on both dual wheel tires under heavy snow and ice conditions, 4 used them where the road conditions were difficult, and 3 used them where clearance was possible on their trucks. One operator uses dual chains on tractors, another uses them on plow trucks. These further explanations are interesting: "Outside dual on light street delivery. Both duals on extreme delivery such as domestic coal business."; "On one dual wheel where duals are spaced far apart"; "Long, fast runs, chain on outside only. Heavy pulling, over both duals."

The average annual investment in tire chains of those using tire chains was \$224.06 per fleet. In connection with this average, it should be remembered that the average fleet replying to the questionnaire consisted of 26.31 vehicles—22.41 trucks and 3.9 passenger cars.

Replacement links are used by 103 of the fleet operators; 17 operators do not use them. Thirty-one operators failed to answer the question. Sixty-six operators expressed a preference as to brand of cross link, with 37 naming the same brand.

It is hoped that fleet operators will benefit by thus "comparing notes" with other fleet operators in the pages of COMMERCIAL CAR JOURNAL.

### Cleary a Candidate for Trustee

James M. Cleary, vice-president of Rocke, Williams and Cunningham advertising agency, former director of the Studebaker Corp., and president of the S.P.A. Truck Corp., is the Democratic candidate for trustee of the University of Illinois.

### Duane Van Horn

Duane Van Horn, an executive of the E. G. Budd Co., Philadelphia, was killed last month in an airplane crash at Beach Haven, N. J. He was responsible for the development of the stainless steel commercial car body business of E. G. Budd.



—the trucks that are  
"BUILT TO MEET  
A CONDITION"

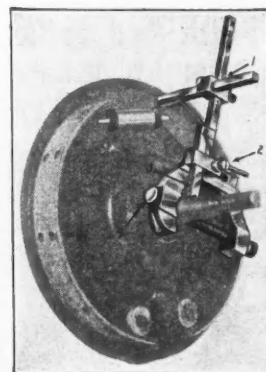
THE **HUG** COMPANY  
Highland • Illinois

**McCORD REFRIGERATION  
—FUEL SYSTEM  
FOR TRUCKS  
REFRIGERATION  
AT NO COST  
—BY THE FUEL  
THAT RUNS THE MOTOR**

**McCORD RADIATOR AND MFG. CO.  
DETROIT**

### New Brake Mike

THE Stiles-Barrett PBT Brake Mike is a new item being developed by the Stiles-Barrett Corp., 2741 Washington Blvd., St. Louis, Mo. (This was formerly the Stiles-Medart Co., but the entire interest of the Fred Medart Mfg. Co. was purchased by Jack Stiles and Harry Barrett and the company name changed.)



The brake mike instantly "center mounts" on any spindle or axle—front or rear—passenger car or truck, and makes it easy for any mechanic to properly adjust brakes. It enables operator to centralize and adjust brake shoes to exact drum size. Construction and operation is such that it eliminates dummy drums, and permits mechanic to see what he is doing. Universal Model \$6.75 complete.

COMMERCIAL CAR JOURNAL  
SEPTEMBER, 1936



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Your trucks need the greater safety of genuine

**BERG**

**POWER BRAKES**  
WITH  
**REACTIONARY CONTROL**

for  
**FORD**  
**CHEVROLET**  
and **INTERNATIONAL TRUCKS**

Up to 3-Ton Pay Load, **\$18**

Above 3-Ton Pay Load, **\$25**

Why pay more? The BERG Brake has everything and is fully guaranteed. Satisfaction assured. Write at once for discounts.

Power Brakes for Pass. Cars, \$12.50

**BERG BROS. MFG. CO.**  
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*Fleets keep moving*



—when re-ringed with **MOLIUM**  
The new economical positive oil control method.  
Write for details  
Simplex Products Corporation  
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MOLIUM PISTON RINGS

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VALVES • GUIDES • SPRINGS • KEYS  
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The Toledo Steel Products Co.  
3304 SUMMIT STREET  
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**FOLLOW THE LEADERS**  
*for they know the way!*

Buy  
**AUTOCAR TRUCKS**

THE AUTOCAR COMPANY  
ARDMORE, PA.

Branches in 50 cities

## Facts on Diesel Fuels

(CONTINUED FROM PAGE 31)

rels. And finally, back in 1933, one of the oil companies started a filling station in Los Angeles for diesel fuel.

Today it's probably no chore at all to get the best available diesel fuels anywhere along the Coast. As a matter of fact, you can get it in a few other parts of the country where there is enough diesel equipment around to make it worth while.

No one knows exactly how many diesel trucks there are on the road this year but it's a safe bet that the number is around 1500 units. That breaks the ice for the new idea in transportation but as we mentioned in a diesel fuel article in *COMMERCIAL CAR JOURNAL* for January, 1935, there are about 175,000 vehicles on the road ranging in capacity from 2½-tons and upward, of which a reasonable percentage may be dieselized, and each year we have an added registration of about 20,000 units within the same range.

That promises a big domestic market for the diesel. But it also means that eventually the dieselized trucks will spread out into other parts of the country—into places where the question of fuel supply hasn't yet been a problem.

To guide the fleetman, the engine builders and others supply specifications which help you to select the most suitable fuel out of the materials available in your locality. Even so, the best you can do at the moment is to use a suitable grade of the ordinary furnace oil, perhaps a little more refined as to freedom from water and dirt, but you take it regardless of its CETANE rating.

Anyhow, the upshot of it is that the oil companies are determined to take hold of the situation before it gets out of hand. And unquestionably the smartest thing the oil industry can do, not only in the interest of its good customers but in its own interest, is to place the greatest emphasis upon the needs of the automotive diesel users and work out the problem cooperatively with the diesel engine manufacturers. In fact, a joint project along this line has been in progress for some time and it can be made a most potent force if everyone gets behind it aggressively.

Nevertheless, the diesel fuel situation offers a serious problem to the oil companies. If it were possible to use the regular grades of furnace oil without refinement, the problem of availability would be quite simple. The trouble is that furnace oils vary between different refiners and the same truck going through different localities would experience fuels of entirely different qual-

## The BURCH BALANCED POWER HOIST



Balanced power for raising or lowering—automatic locking, any position—one moving part—no gears—no oil lines—no heating or foaming of oil. Plain and Braced Side Bodies—1½ and 2 Yard capacities.  
**FAST! POWERFUL!**

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**THE BURCH CORP.**  
Dept. M—CRESTLINE, OHIO

THE SPECIAL honey-comb construction of the Spongex Sponge Rubber Seat Cushion for Trucks and Buses, gives exceptional riding qualities.

The total air space within the cushion is so great, that there is no "packing" of the rubber under the severest shocks. Vibration is effectively absorbed, too. Spongex Cushions have no metal in them—removing all danger of injury. They can be counted on to last as long as the vehicle in which they are installed.

For Prices and Description  
Address Dept. C

**SPONGE RUBBER  
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# SPEED WASHING



**The Modern Way to Clean Cars, Busses and Trucks**

Much more economical—much faster—and thorough to the "nth" degree. Means bigger wash rack profits, or reduced maintenance cost on keeping your own fleet clean. Only Rotawasher brings you Speedwashing. It's years ahead of ordinary methods. Naturally, it's quick to pay for itself in increased business, or reduced costs.

**THE ROTAWASHER CORP.** Write at once for full details.  
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CLEVELAND, OHIO

## ARMORPLY

● A metal faced plywood panel of high quality for building better panel bodies.

Armorply is the lightest panel of its type available. It is faced with rust resisting galvanneal steel, and has a hard birch back.

Write for samples, prices and full information.



## U.S. PLYWOOD

UNITED STATES PLYWOOD CO.  
103 Park Avenue New York, N. Y.

### Watch Alma in November!

Details of the revolutionary new ALCO front drive and four wheel drive conversion units for Ford and Chevrolet trucks will be published for the first time in November.

Dealers and fleet owners desiring early information may register requests with

**Alma Motor Company**  
884 Penobscot Bldg.,  
Detroit, Michigan

ity. Moreover, even the furnace oils aren't dispensed at service stations except in places where there is sufficient demand.

The fact of the matter is that diesel must be a specification fuel, at least to the same extent as gasoline, in the interest of uniformity. This assures the user of a definite performance regardless of the source. Oil refiners, certainly the national distributors, have come to recognize this fact.

But just as soon as we get away from the regular grades of furnace oils which have been used up to now, we shall have to be reconciled to a higher price for diesel fuel. Perhaps the price may not be much higher but certainly more on the order of 7 to 8 cents per gallon, without tax, rather than 3 or 4 cents.

Another thing to consider is that the national distributor can't go into production on a specification fuel until there is a known market of sizable volume. Nor can he make the fuel available even in bulk except in localities where there is reasonable demand.

As a matter of fact, like any other problem of supply and demand, diesel fuel has a reasonable basis for future activity. In the present study two or three large oil companies tell us that their refinery setup makes it impossible for them to produce anything but gasoline economically, so that they would be out of the picture at least until the business grew big enough to make it worth while building a new plant. On the other hand, a number of small refiners who can make money on specialties have been cashing in on the diesel business west of the Mississippi.

It is encouraging to learn that a number of the biggest refiners in this country have started to market specification diesel fuels, some even under special brand names.

Although the distribution of these fuels is restricted to certain trading areas, the refiners tell us they would be most eager to increase the scope of distribution wherever it would be justified by the growth of diesel transportation. In fact, one of the largest companies in the East would even go so far as to set up service stations wherever they would pay. Now that's going a long way!

So much for that. We do know on the basis of this study made for COMMERCIAL CAR JOURNAL readers:

—that oil companies are working on specification fuels for the diesel;

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#### FOR SALE

Seven International C-60 rear axle units complete—hydraulic brakes—hubs for Budd wheels—used ninety days—cheap. L. G. Everist, Incorporated, Sioux City, Iowa.

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...Shoulders the Battery's Burden...

Write for booklet that tells how

**UNITED AMERICAN BOSCH CORP.**  
SPRINGFIELD, MASS. New York, Chicago, Detroit

## VEL-VAC SALES & SERVICE

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193 cities and 48 states—

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New Hoof Governor Sales Manual, just off the press. 64 pages! Packed with facts, charts, graphs and statistics... all arranged in easy, quick, ready reference form. An invaluable guide for any person who buys, sells or specifies governors for truck, passenger car, bus, tractor and industrial engines. The manual is free. Send for your copy at once.

**HOOF PRODUCTS CO.**  
162 No. Franklin St., Chicago, Ill.

## DEPENDABLE! WINDOW-WIPER

If you want air-brake dependability, write to the Hays Corporation, Michigan City, Indiana, for literature describing this new husky wiper that slashes through clogged mud or snow with the 100-lb. kick of the air-brake supply behind it.



## AIR-PUSH WINDOW-WIPER

## THORNTON

Dual Ratio Four Rear Wheel

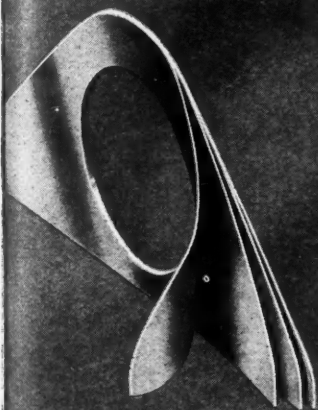
**DRIVE FOR TRUCKS!**

Is setting new records!

**THORNTON TANDEM CO.**  
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# I am your profit in bearing adjustment



I GIVE you .002" adjustment in each lamination! No miking... no filing. Just p-e-e-l off .002" or more at a time.

I provide the precision required for modern bearings... quickly! I make service adjustments profitable!

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## LAMINUM

FEDERAL-MOGUL CORP.  
DISTRIBUTORS: DETROIT, MICH.

547

—that a number of these already have a branded product on the market;  
—that distribution of such fuels is available in certain areas and can be extended wherever there is sufficient demand;

—that the price of specification must be somewhat higher than for furnace oils and when this is accepted by the user, more of the larger companies will find it economical to enter the picture;

—that for some time to come the

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SEPTEMBER, 1936

source of specification diesel fuel will be the furnace oils. These stocks must be refined, modified, and selected for a definite cetane number or ignition quality.

WITH these general statements in mind, we are prepared to give you some definite information on the diesel fuel picture. Referring to Table I, we have listed the following details on the products of some large refiners:

- trade name, if so marketed
- areas of distribution
- present market
- how distributed, i.e., bulk, barrel, service station, etc.

The refiners' specifications on the special diesel fuels, wherever available for publication, are given in Table II.

It would be quite beyond the scope of this article to attempt to compare the specifications given here or to reconcile any differences that may exist. Suffice it to say that the oil industry's research engineers are hard at work on the development of, say, two grades of fuels that may be suitable for all makes and types of automotive diesels. If this can be done, and the oil experts are rather optimistic about the outcome, we will have a national specification fuel quite comparable to the present status of gasoline.

To this end, a committee of the American Society for Testing Materials developed a tentative specification for diesel fuels which will be found on pages 17-20 of the report of A.S.T.M. Comm. D-2 for 1935. It includes two automotive diesel fuels—1-D and 3-D and comprises a rather complex definition of ignition quality, combining four different criteria including cetane number.

This is purely an experimental attempt at standardization issued as a sort of feeler to the oil industry. Opinions are divided as to the value of this specification but undoubtedly some simplified form of this specification will ultimately result.

WHILE the oil industry is thus engaged in working out a national standard which will be acceptable to everybody and which will provide the fleetman with a uniform fuel for his diesel equipment, the engine builders and equipment manufacturers have made their own studies and can give the user specific instruction as to the fuel he can burn. Each one has his own ideas on the subject. Theirs are very general specifications designed to enable the user to select a suitable product from the variety available in his part of the country.

So far as we know the foregoing is the first published data on the specification fuels placed on the market re-

## THE ROBINSON . . . . . UNIVERSAL COUPLING HOLDER

- HOLDS SECURELY
- SUPPORTS HOSE
- SEALS FROM DIRT

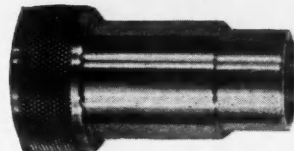
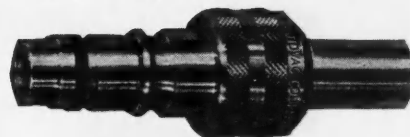


- Fits all standard type couplings... Protects male coupling from damage which destroys brake efficiency.

\$1.25 LIST PRICE

## THE ROBINSON AUTOVAC COUPLER . . . . .

Connected . . . Autovac is fully open! Disconnected . . . Autovac is tightly closed! No valve to turn off . . . nothing left to chance. Saves time and money. Autovac protects hose lines and mechanism from water and dirt . . . it's automatically sealed when not in use.



RELIABLE MACHINE SCREW CO.  
NEWARK, NEW JERSEY

cently. We expect to have returns from three or four other national marketers so that the data may be added to this article by publication in a subsequent issue of COMMERCIAL CAR JOURNAL.

It is too early to draw conclusions but there is a moral to be drawn from available information. With the material in this article it will be possible for you to contact the oil producers who serve your territory and with their help select the standard fuel that seems best suited to your engines. This selection can be further checked with the engine builder and between the two you can arrive at a very satisfactory decision.

Price of fuel is, of course, a determining factor and you will have to make your own decision as between a high priced specification fuel and a straight run domestic fuel oil. But if our present knowledge means anything at all, you will find it most economical to select on the basis of suitability rather than on price. You can be the best judge of that.





## BEARING REPLACEMENT COMPLETES THE JOB OF OIL CONTROL!

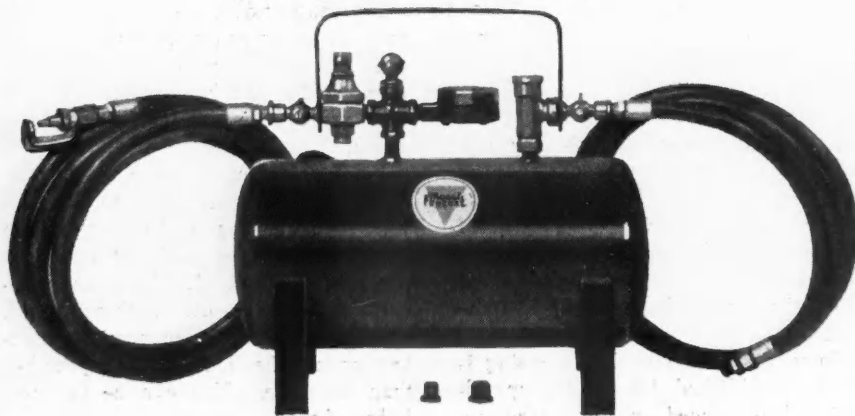
**W**HEN your diagnosis of poor engine performance, lost power and pep and high operating costs indicate an overhaul to include new rings, pistons or cylinder reboring . . . remember the engine bearings, and check them when the engine is opened up!

*Worn engine bearings have been proven a principal cause of oil pumping and poor performance, and on any overhaul to correct excessive oil consumption, while rings, pistons and reboring do their part, when the trouble starts at the bearings, correction must start there, too! When the engine is open for other service, it is wise economy to replace worn main and con rod bearings and correct oil pumping at the source of trouble.*

Use Federal-Mogul replacements. Connecting rods babbitted by Federal-Mogul and Federal-Mogul insert precision-type bearings are engineered for the job of oil control.

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## BEARING OIL LEAK DETECTOR CUTS YOUR SHOP COSTS!

The new Bearing Oil Leak Detector tests all engine bearings, oil headers and internal oil lines on all full-pressure lubrication systems, with scientific accuracy. With the Detector, you can determine EXACTLY the condition of all bearings and oil lines.

And you save time on each overhaul by pre-testing for hidden faults. You can also use it to get a final check-up on every reconditioning job, so that no unseen defect shall pass unserved. Ask your Federal-Mogul jobber, or use the coupon below to get full information and price on the portable, easily-used, low-priced Bearing Oil Leak Detector.

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